ELLEN MACARTHUR FOUNDATION

Pushing the boundaries of EPR policy for textiles

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About this report

This report, written for policymakers, aims to contribute to the global debate on textile waste and pollution by focusing on Extended Producer Responsibility (EPR) policies — a necessary part of the solution to achieve a circular economy for textiles. EPR is a crucial policy tool to ensure discarded textiles are collected and put back in circulation at scale. To date, three countries have adopted EPR policy covering textiles (France, Hungary, and the Netherlands). EPR policy for textiles is currently debated and/or proposed in a range of other countries and regions (including Australia, Ghana, Kenya, Colombia, California, New York, and all EU Member-States).

This report aims to contribute to this emerging policy conversation, outlining a shared direction of travel and the opportunity for EPR to create ambitious outcomes that accelerate the circular economy transition.

The data modelling and analytics included in this report focus on selected countries (including Chile, European Union Member States, Ghana, India, Kenya, Tunisia, and the USA), chosen due to the significant role they play in the trade of used textiles, as well as the existence or ongoing development of EPR policy for textiles in these countries.

The authors recognise that certain significant topics of relevance to the global textiles debate are not covered in depth in this report. For example, the labour market of today's global reuse and recycling economy, and potential job impacts of a circular economy transition, are not well understood today and require further exploration.

To quote this report, please use the following reference: Ellen MacArthur Foundation, Pushing the boundaries of EPR policy for textiles (2024).

Box 1

What is covered by the term “textiles”

In this report, “textiles” refers to textile products that are generally in scope of existing (or likely to come under future) EPR obligations: clothing, footwear, and household textiles such as bed linen.

Products such as mattresses, technical textiles, and furniture with upholstery fall outside of the scope of this report, as these are usually not covered under EPR for textiles policies, but instead are covered under separate EPR schemes (e.g. furniture). In addition, clothing, footwear, and household textiles all enter the same collection systems when they are discarded, which are different from collection systems in place for furniture and mattresses.

The focus of this report is on discarded textiles, i.e. textiles that are discarded by citizens and enter a form of waste management (waste collection or uncontrolled disposal). These textiles may or may not have reached the end of their useful life at the point of disposal.

Box 2

What we mean by Extended Producer Responsibility (EPR)

In this report, EPR refers to **mandatory, fee-based Extended Producer Responsibility schemes.**

The OECD defines EPR as an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of the product's life cycle.[1] Under EPR legislation, businesses that place products on the market ("obligated producers") become responsible for managing their products when these are discarded by consumers.

In the context of textiles, obligated producers are typically brands, retailers, and online marketplaces that place clothing, footwear, and household textiles on the market.[2] The responsibility imposed on these producers may be financial, organisational, or both.[3]

EPR is a performance-based regulation in which specific outcomes and objectives are set and defined by law, and so are the roles and responsibilities of stakeholders involved in delivering on these (such as obligated producers, local governments, charities, and non-profit operators). Generally, companies can fulfil their responsibility individually, by putting in place their own collection, sorting, reuse, and recycling systems, or collectively, by joining efforts to establish a shared system.

Producer Responsibility Organisations (PROs)
In a collective EPR scheme, obligated businesses delegate their responsibility (fully or partially) to a third party. Typically — but not exclusively — the third party is a joint PRO, which fulfils obligations for the in-scope products on the businesses' behalf, and coordinates the activities identified as within the scope of such a body. The legally obligated businesses pay the PRO, in order to cover the necessary expenses for achieving the legally required outcomes and objectives.

Fees
The PRO is normally funded through fees that each obligated producer pays to the PRO. Such an EPR scheme can be referred to as a fee-based EPR scheme. The scope, design, and operating methods can vary across countries. In fee-based EPR schemes, the funding remains ring-fenced and dedicated to the after-use management of the product and related activities (such as data-gathering and support to R&D). These activities should be clearly defined in the scope of the EPR legislation and in the responsibilities of the PRO body.

Jurisdictional context
In most countries, national governments adopt, implement, and enforce EPR policy. In federal countries however (such as the USA and Belgium), sub-national governments form the legal authority enacting EPR regulations. For this reason, this report refers to the "jurisdictional context" or "jurisdictional borders", to indicate the geographical remit where EPR is implemented and enforced.

Executive summary

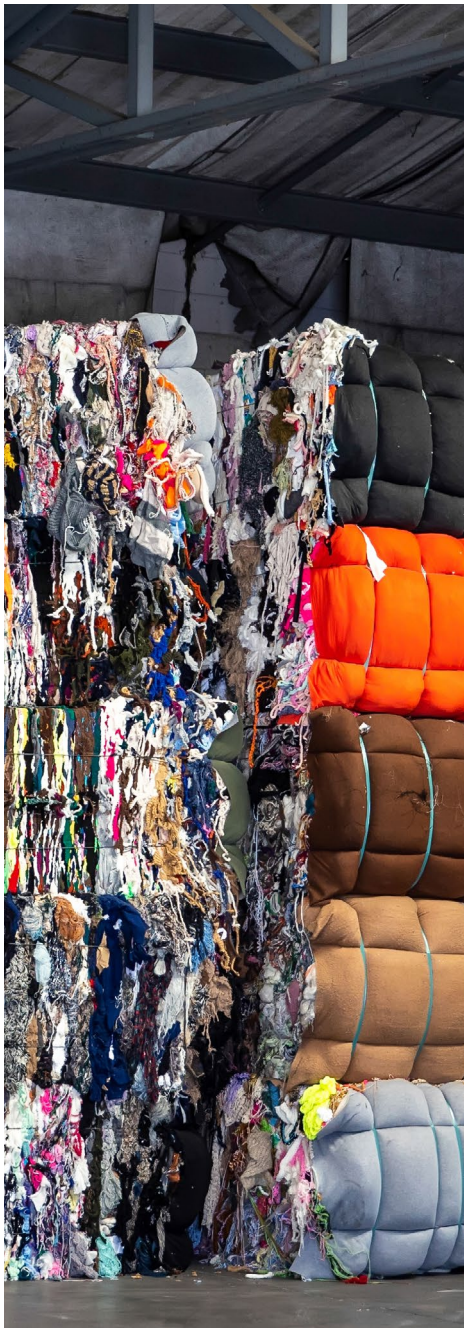
Around the world, the vast majority of textiles leak out of the system when they are discarded: they are incinerated, landfilled, or leak into the environment. Textile waste is a direct consequence of our linear economic system. Currently, products are not typically designed to last and are hard to recycle. Most business models are linear, with high levels of throughput, low rates of utilisation, and low levels of recycling.

To fix this leaky system, separate collection infrastructure for textiles needs to be scaled up dramatically and, importantly, implemented in locations where it currently does not exist. Where separate collection systems exist today, they are underdeveloped and do not capture all textiles placed on the market. Because of their potential market value, textiles deemed rewearable, and therefore suitable for reuse, are prioritised for collection in today's system. After collection and sorting, reusable textiles are traded around the world. While such reuse exports lead to increased value capture and utilisation of clothing, they also cause a disproportionate waste management burden on importing countries, which often lack the infrastructure to manage clothing when it is no longer reusable.

A comprehensive circular economy approach is the only solution that can match the scale of the global textile waste problem. In a circular economy, textile products are used more, made to be made again, and made from safe and recycled or renewable inputs. In this system, businesses contribute to supporting infrastructure commensurately with what they place on the market, to ensure their products are collected and reused, repaired, remade, or recycled into new textile products.

Today, the economics for separate collection and recirculation of textiles do not stack up — this is a key barrier to achieving a circular economy for textiles. To establish separate collection systems at scale, structural funding is needed to cover the net cost associated with managing all discarded textiles, not just the fraction with high market value. Where separate collection systems are in place, they are largely funded through the reusable clothing fraction. This market-driven system faces significant pressure, and will not achieve further expansion nor material capture unless dedicated funding is put in place to cover the cost.

This publication lays out why mandatory, fee-based Extended Producer Responsibility (EPR) policy is a necessary part of the solution to build a circular economy for textiles. EPR policy places responsibility on producers with regard to the collection, sorting, and recirculation of the products they place on the market, resulting in funding that is dedicated, ongoing, and sufficient to manage textile products when they are discarded. Without EPR policy, the collection, reuse, and recycling of textiles is unlikely to be meaningfully scaled and tens of millions of tonnes of textiles will continue to be landfilled, incinerated, or will leak into the environment every year. In a world of finite resources, EPR policy helps create new sectors and employment dedicated to reverse cycle activities, such as collection, sorting, reuse, repair, and recycling. As such, it can help shift the economic balance away from the production of new products and materials.



This report proposes a common approach to EPR policy design for textiles, based on circular economy principles. To achieve a global circular economy for textiles, national EPR systems need to align around the same key objectives, while setting targets that reflect a specific understanding of the national and local context, stakeholder landscape, and infrastructure availability. In addition, alignment around common definitions and stakeholder involvement is crucial to the effectiveness of EPR policy.

In its current form, the implementation of EPR policy is incomplete and leaves opportunities untapped. Today, producer responsibility stops at the point of export, diminishing EPR's potential to collect and manage discarded textiles in countries where they ultimately end up. As reusable clothing is traded around the world, a potential transboundary extension of EPR needs to be explored to achieve a global circular economy for textiles.

Importantly, EPR has the potential to break away from its traditional downstream focus and deliver circular economy outcomes, but this potential is currently underexploited. This report outlines how EPR can stimulate circular design, extend the use phase of textile products, and address pollution impacts that occur throughout the use phase.

As the regulatory process for EPR development takes years to come to fruition, businesses should not wait to accelerate progress and turn circular economy ambitions into demonstrable action. Coordinated and compounding industry action is needed to challenge the linear economic model at its core, and to capture the full value opportunity by keeping products and materials in use for as long as possible. Voluntary business actions, including the establishment of voluntary EPR schemes, are key to accelerate progress, creating market demand for circular economy solutions, in anticipation of mandatory policies.

This report is intended as a starting point, not to provide all the answers. We recognise that EPR is most effective as part of a wider circular economy policy framework, addressing product design and business models. EPR is a first and necessary step, but more needs to be done to transform the textile system. We also recognise there are other important considerations and challenges that need to be further understood which are not part of the scope of this report, including the socio-economic impacts of implementing EPR policy for textiles, the environmental impacts of textile waste leakage, and the technological innovations required to reuse and recycle at scale. For this we encourage further research.

In support of this report

Ghana has a thriving reuse economy, in which Ghanaians regularly purchase used clothing and use the services of local repair businesses. However, our reuse economy also generates waste, as items eventually become non-reusable and are discarded. We are developing an EPR policy for plastics, which will be expanded to textiles and other material streams over time. The common approach proposed in this report is certainly in the right direction, and I expect that all countries will pursue a minimum level of alignment with the approach. To eliminate textile waste, countries at both the import and export ends of the used textiles trade must collaborate more closely.

Oliver Boachie
Special Advisor to Ghana's Minister of Environment, Science, Technology, and Innovation

Textile waste is a significant contributor to the climate crisis. But right now, we don't have sufficient infrastructure to responsibly manage discarded clothing and increasing amounts of textile waste, and our existing systems do not support consistent, convenient, or widespread collection needed to incentivise the reuse and recycling of textiles. That's why we need comprehensive policy to make the economics work for textile reuse, repair, and recycling. Particularly, EPR offers an opportunity to do just that while holding the textile industry responsible for its role in the system.

Congresswoman Chellie Pingree
U.S. Congress

France has an important legacy of EPR policy for textiles, as our textiles EPR scheme has been in place since 2008. In recent years, we have been working to evolve our EPR system beyond collection and sorting operations, towards stimulating circular business models with a particular focus on repair and recycling. This way, EPR helps ensure products are used longer before being discarded. Moving forward, EPR should continue to evolve and should address the fate of used textiles after exportation. For example, EPR presents a significant opportunity to enhance transparency and traceability on the used textiles trade. By doing so, it can help ensure that in the future, we only export products to markets where demand and capacity exists to reuse textiles and manage them after use.

Léonard Brudieu
Deputy Head for Circular Economy,
French Ministry for Ecological Transition, DGPR

In Chile, our ambition is to expand our EPR legislation to include textiles — a process we'd like to kickstart in 2025. The minimum objectives set out in this report are a relevant starting point. In Chile, EPR for textiles will not only improve separate collection and sorting but will also support increased local reuse, by including tailors and small upcycling businesses as EPR fund recipients. Additionally, EPR can deliver positive social impacts by training, involving, and integrating informal workers, building on our experience with the packaging EPR system. But we cannot recycle our way out of Chile's high per-capita textile consumption. While EPR may not be the only solution, it is an important part of the broader effort to shift towards a circular economy.

Tomás Saieg
Chief, Circular Economy Office, Chilean Ministry of Environment

In 2023, EPR policy for textiles entered into force in The Netherlands. Throughout the development of this policy, and from the many stakeholders we consulted, we learnt that while EPR is essential, EPR alone is not sufficient to achieve a circular economy. Other policy measures such as ecodesign are needed. Still, EPR is an important part of the toolbox of policies that can help reduce the volumes of textile waste generated. There is room to further develop EPR policy in line with principles of the circular economy, by giving more attention to circular design, reuse, and repair.

Marije Slump
Senior Policy Advisor on Circular and Sustainable textiles, Dutch Ministry of Infrastructure and Water Management

Textile and plastic waste and fragments represent one of the biggest environmental problems related to pollution and biodiversity loss in the world. A large volume of plastics is hidden in other products, such as textiles and packaging. That is why it is important to expand debates on these products and their appropriate disposal to reduce pollution.

Adalberto Maluf
Brazil's National Secretary for Urban Environment and Environmental Quality of Ministry of Environment and Climate Change

A growing number of governments are considering adopting policy to require EPR schemes for textile products to better address related environmental impacts. This report by the Ellen MacArthur Foundation reviews the limited existing experience with EPR for textiles and will help to inform future policy development on this important issue.

Peter Börkey
Circular Economy Lead, OECD Environment Directorate

Unsustainable consumption and production patterns drive the climate, nature, and pollution crises and hinder opportunities for resilient, inclusive, and just socio-economic development. The textile sector is complex. Its impacts on the environment, on people, and economies call for a transformative change that requires an unprecedented level of policy coherence and collaboration across countries and between stakeholders, accompanied by the leadership and commitment of responsible industries. This EMF report contributes to expanding existing knowledge. UNEP is working to accelerate the transition towards a sustainable and circular textile value chain by scaling circular business models and product design, addressing overproduction and overconsumption, and eliminating hazardous chemicals, including via EPR as well as through strategic partnerships such as with EMF.

Sheila Aggarwal-Khan
Director, Industry and Economy Division,
United Nations Environment Programme

Tackling textile waste generation requires collaboration on a global scale. At the Global Action Partnership for Extended Producer Responsibility, our mission is to advance EPR implementation around the world, including for textiles. We believe this report by the Ellen MacArthur Foundation is an important step to advance the debate on EPR policy design and the need for cross-border alignment and collaboration.

Nicole Bendsen
Global Action Partnership for EPR

EPR policies are essential to reducing textile waste and pollution. At UNECE we have been working closely with governments and key actors across the textile and fashion sectors to promote the principles of accountability, circular economy, and traceability through our Sustainability Pledge initiative. This report supports the ongoing efforts towards a circular economy. I encourage all actors in the textiles system to consider its conclusions.

Maria Teresa Pisani
Chief ad interim Trade Facilitation Section,
United Nations Economic Commission for Europe

The report on EPR for textiles by the Ellen MacArthur Foundation comes at a critical time as countries in the EU and in other regions of the world are planning to or starting to put in place EPR schemes. Such schemes are critical in the aim to move away from fast fashion and to reduce textile waste. To be successful, EPR schemes have to be designed carefully to make sure they are not only a means to ensure that the producers pay for the waste handling, but also act as an instrument to ensure sufficiency, higher quality textiles, and less textile waste.

Lars Fogh Mortensen and Sanna Due
European Environment Agency

At Decathlon, we believe that well-designed EPR schemes are vital to incentivise sustainable design and to develop a strong and innovative textile waste industry. To achieve this, collaboration is critical. We must work together to build a global system that is capable of closing the loop through collection, reusing, sorting, and recycling. “Pushing the boundaries of EPR policy for textiles” lays out the necessary steps to help us get there.

Anna Turrell
Chief Sustainability Officer, Decathlon

An EPR-focused report on textiles is essential for the textile sector to drive better growth. Textiles significantly impact the environment, and adopting circular business models like repair, rental, resale, and remaking can decouple revenue from production. This approach enhances efficiency, meets regulatory demands, and provides a competitive advantage. Transforming the textile value chain into a circular model addresses environmental and social impacts, while supporting people, prosperity, and equity. In Colombia, we are currently piloting EPR for textiles on a voluntary basis and we look forward to the next steps on this journey.

Ruben Goldsztayn
Director of Sustainable Production and Consumption,
National Business Association of Colombia (ANDI)

This report is a testament to the expertise and dedication of the Ellen MacArthur Foundation in its objective to accelerate towards a circular economy for textiles. The research and comprehensive data analysis will be extremely valuable for the Australian clothing industry and for Seamless, Australia’s national product stewardship scheme, as we deliver on our purpose and navigate our way towards achieving clothing circularity by 2030.

Ainsley Simpson
Chief Executive Officer, Seamless Australia

For over 30 years, EXPRA and its 34 members have successfully implemented EPR for packaging, proving it is a necessary part of the solution towards a circular economy, when underpinned by proper legal frameworks and enforcement. This insightful EMF report adapts EPR experiences from packaging and other sectors to textiles, guiding governments and the entire textile value chain. EPR can greatly contribute to transforming textiles into durable products with abundant second-life options, keeping resources in the economic cycle for as long as possible.

Joachim Quoden
Managing Director, EXPRA

Textile waste is a critical global issue, largely stemming from our current linear economic system where products are neither designed for longevity nor for recycling. To address this, we must dramatically scale up separate collection infrastructure, especially in areas where such infrastructure does not exist. EPR policies are crucial, mandating producers to fund the collection, sorting, reuse, and recycling of textiles. EPR can also stimulate circular design and extend the use phase of textiles, and it can help to align global efforts, across governments and industry, to create a circular economy for textiles.

Jan Patrick Schulz
Chief Executive Officer, Landbell Group

Textiles are woven into all facets of our lives — in clothing, furniture and construction materials —and we are not effectively managing how they are processed at end of life, reinforcing wasteful economic practices and deepening environmental degradation. We urgently need to adopt policy tools that take a lifecycle approach for redesigning, reusing, and reincorporating textiles in our economy in creative and generative ways — and EPR offers a valuable starting point for this.

Kobie Brand
Deputy Secretary General, ICLEI and Regional Director, ICLEI Africa

This report highlights why EPR policy is a necessary part of the transition to a circular economy for textiles. Mandatory, fee-based EPR policy is necessary to ensure producers are held responsible for the collection, sorting, recirculation, and eventual end-of-life of the products they place on the market. Moving beyond its traditional focus on waste management, EPR policy can be designed to build a circular system, in which products are designed for a long use phase. EPR policy can also deliver solutions for textiles exported across borders, by setting aside funding to support importing countries to collect, sort, and recirculate and ultimately process used clothing and other textiles.

Hilde van Duijn
Managing Director, Circle Economy Foundation

The time for talk is over — action is needed now. This report clearly shows that to fix our “leaky” textile waste system, we need better collection infrastructure. But it’s not just about collecting and recycling. We need to look at EPR more holistically and understand how it can drive better product design. This report does an excellent job of bringing these issues to light. It is time for businesses to step up, work together, and make sustainable textile management a reality.

Anjali Krishnan
Program Managev, Alternate Materials, IDH

Today's textiles system is wasteful

The vast majority of textiles leak out of the system when they are discarded.

The vast majority (more than 80%) of textiles leak out of the system when they are discarded: they are incinerated, landfilled, or leak into the environment (see Appendix A). In the EU, 88% of discarded textiles end up in mixed household waste and are therefore incinerated or landfilled.[4] In the US, it is estimated that 85% of textiles end up in landfill or incineration after having been discarded.[5] Population growth and the increase in disposable income in emerging markets are projected to continue to drive the growth in waste generation, if we continue business-as-usual.

When textiles are discarded, they are extremely likely to become mismanaged. As separate collection systems are underdeveloped (see "Fixing a leaky system"), the vast majority of these products are not collected separately, with no chance of a productive afterlife. When textiles are disposed of as part of mixed household waste, they are not sorted out and are instead landfilled, incinerated, or abandoned in the environment.

The environmental and social costs of mismanaged textiles are significant, and further exacerbate the triple planetary crises of climate change, biodiversity loss, and pollution. Textile waste can end up being burned in open pits, dumped onto beaches and into rivers or seas, or disposed of in unsanitary landfills and dumpsites. These pathways all lead to the release of pollutants, including hazardous chemicals, threatening species and habitats.[6] Substances of concern that are contained in textiles, such as dyes or chemicals that have been introduced during production or use, can leak out as textiles degrade into the environment. In particular, the release of microplastics causes significant harm to marine ecosystems.[7] When textiles are landfilled or burnt in the open, without controlling emissions, the combustion gases also have the potential to release substances of concern.[8] As textiles decompose, natural fibres such as cotton and wool generate the greenhouse gas (GHG) methane, which is released into the environment if the landfill is not properly controlled. Plastic-based fibres will remain in landfills for decades, with the average polyester product likely to survive for over 200 years.[9] The most vulnerable populations in lowest income tiers are most exposed to textile-related pollution due to the likelihood that they reside nearer to dumpsites and disposal areas. Even where textiles are recycled, improper processes can expose workers to harmful dust and chemicals.[10]

We define mismanagement as "products [used textiles] that are not recirculated after they have been discarded, either because they are: 1) not separately collected, or 2) separately collected but subsequently end up in landfill (controlled or otherwise), incineration (including waste-to-energy), or dumping (including open burning and littering)."

The significant volumes of textile waste are a direct consequence of the current resource-extractive, linear system.

The textiles industry extracts resources to make products, such as clothing and household linens, that are often used for a short time and, ultimately, thrown away. It relies mostly on non-renewable resources, including oil to produce synthetic fibres, fertilisers to grow cotton, and chemicals to produce, dye, and finish fibres and textiles. In this system, large resource externalities are not priced in, including GHG emissions, biodiversity loss, and pollution from textile waste. The clothing industry is a particularly problematic sector as it is characterised by underutilisation, high volumes of unsold products, and high destruction rates. It is estimated that 4–9% of all textile products put on the market in Europe are destroyed before use, after having been returned or unsold.[11]

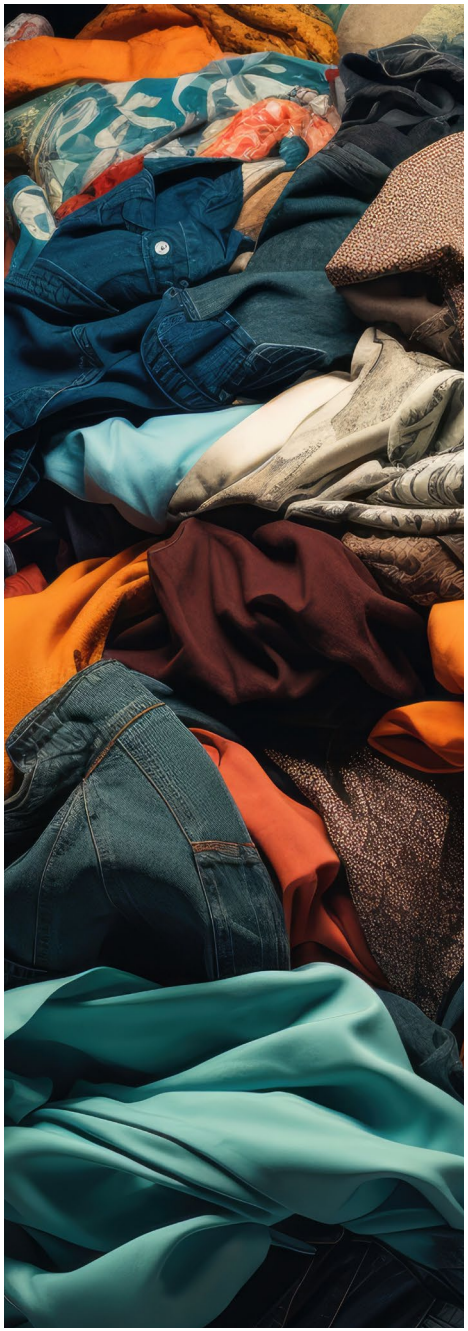
Three main drivers underpin the generation of textile waste:

1 **Clothing is generally delivered through linear, single-sale business models, which do not provide for take-back, resale, or repair operations.** Circular business models[12] represent a key opportunity to decouple economic activity from the use of finite resources and can be explored further in our paper "Rethinking business models for a thriving fashion industry". The Foundation's latest demonstration project, The Fashion ReModel, works with a group of industry frontrunners from across luxury, activewear, retailers, mid-range, and high-street to begin to decouple revenue from production.

2 **Currently, products are not always designed to last and are hard to recycle.** The Jeans Redesign project is an example of how one fashion product can be redesigned to be used more, made to be made again, and made from safe and recycled or renewable inputs. Designing and producing textiles of higher quality is the most powerful way to capture economic value through circular business models and reduce pressure on resources.

3 **Separate collection infrastructure is underdeveloped and does not capture all textiles.** This is the primary focus of this report. We recognise that separate collection infrastructure is only a part of the solution to achieve a circular economy. Profound transformations are required on the level of product design and business models. At the same time, separate collection infrastructure is essential to divert the significant flows of textiles that currently end up being landfilled or incinerated, or leak into the environment, and to create opportunities to keep these products and materials in use.

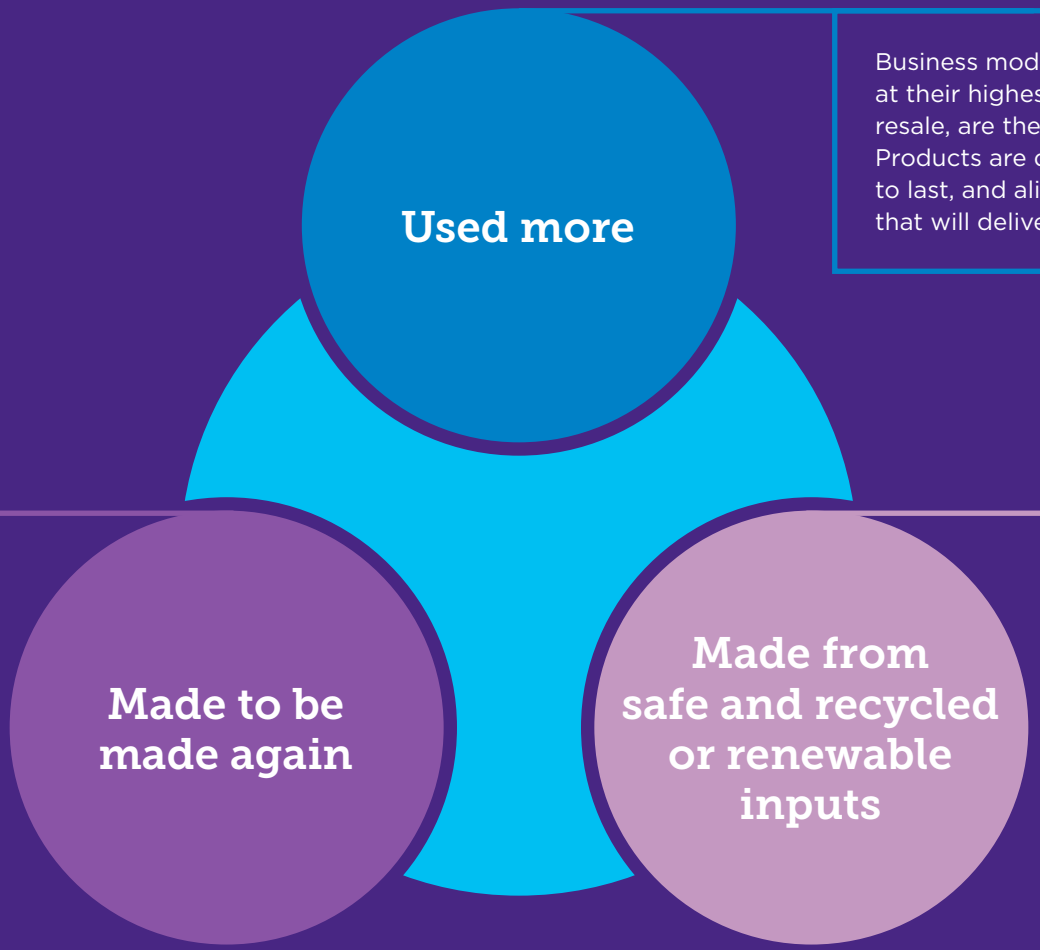
It is now widely recognised that a comprehensive circular economy approach (see Box 3) is the only solution that can match the scale of our global waste and pollution problem. The circular economy is more than a way to treat the symptoms of the current take-make-waste economy. It is a bigger idea that tackles the root causes of many global challenges — such as waste and pollution, climate change, and biodiversity loss — at the same time as providing new economic opportunities.



Box 3

A circular economy for textiles[13]

In a circular economy, textile products are:



Business models that keep products at their highest value, like rental and resale, are the norm across the industry. Products are designed and manufactured to last, and align with the business model that will deliver them.

Products and their materials are designed and manufactured to be disassembled so that they can be reused, remade, and recycled. Products are, in practice, collected and sorted to be reused, remade, recycled, and — where relevant and after maximum use and cycling — safely composted.

Products and their materials are free from hazardous substances. Production and use of products do not discharge hazardous substances into the environment. Production is fully decoupled from the consumption of finite resources: the need for virgin resources is minimised by increasing the use of existing products and materials. Where virgin input is needed it is from renewable feedstocks sourced using regenerative production practices.

In delivering the vision, the rights and equity of all people involved in the textile industry are prioritised.

Fixing a leaky system

Establishing and expanding separate collection infrastructure for textiles is a necessary part of the solution.

To divert textiles from landfill, incineration, or leakage into the environment, it is crucial to build collection infrastructure at scale. Waste management systems need to collect textiles separate from other waste streams — segregating them at source — as this is critical to achieving high reuse and recycling rates. When textiles are mixed with other types of discarded materials, they are prone to contamination, rendering them unsuitable for reuse and recycling.

Separate collection is the only way to keep textiles out of municipal solid waste streams.[14] When textiles are discarded within mixed municipal solid waste, they end up incinerated or landfilled, causing pollution and increased GHG emissions. Collecting textiles separately from other waste streams is the first step to keep these products and materials in use, creating economic value and lowering emissions. A recent study has shown the emissions reduction potential across one region to be as high as 40% CO_2e compared to non-separate collection of textiles.[15]

Today, separate collection rates for textiles are low. Collection infrastructure for discarded textiles is underdeveloped and does not capture all textiles in the system. Where reporting is available, separate collection rates are on average 14% and reach a maximum of 50% (see Appendix B). This means that in countries where separate collection is in place, more than half, and in some countries more than 80%, of textile products placed on the market are still discarded as part of municipal solid waste streams, and therefore end up incinerated or landfilled. This is largely due to the fragmented nature of textile collection systems, which are operated by a range of commercial as well as charitable actors, and which all generally require a bring-back effort from citizens. Curbside collection, as is in place for packaging for example, is generally not available for textiles due to their infrequent and unpredictable disposal patterns. In addition, textiles are particularly prone to contamination and weather conditions, favouring bring-back operations through clothing containers or stores.

Existing systems for separate collection frequently focus on collecting clothing that is deemed rewearable and therefore suitable for reuse. Collected textiles are sorted into hundreds of different grades or fractions, with diverse quality grades indicating their potential market value for sale onto reuse or downcycling markets. In the current model, collectors and sorters rely on the reusable clothing fraction to offset losses incurred in managing non-reusable textiles. As a result, current collection efforts generally seek to limit reception of non-reusable textiles, for example by communicating to citizens that they can only take in textiles that are in good condition.

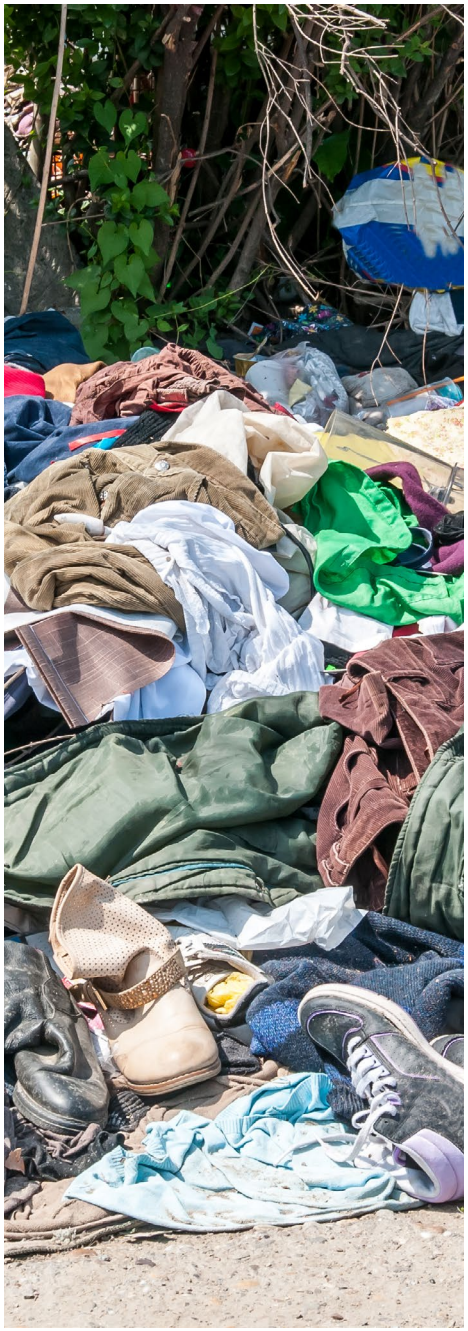


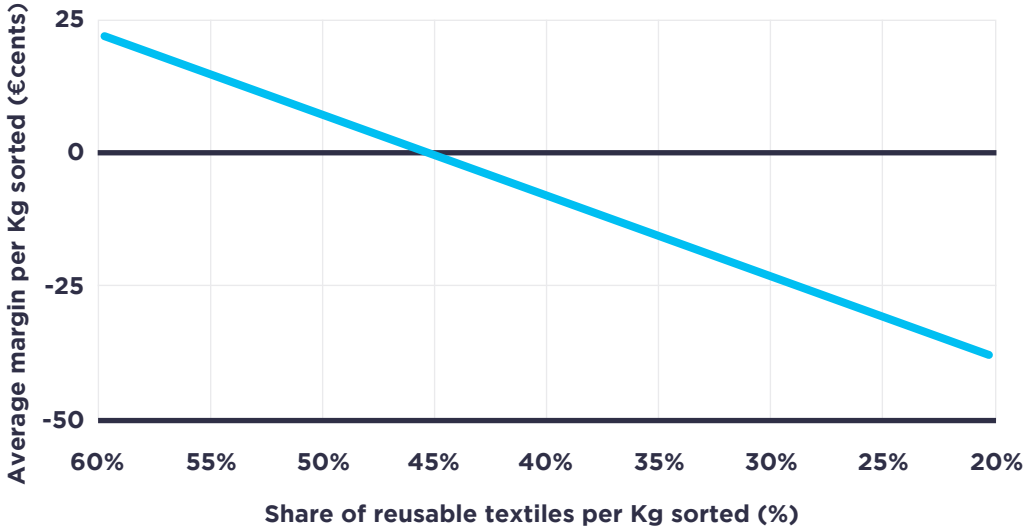
Figure 1

In Europe, the operating margin of the average sorter hinges on the share of textiles that, after sorting, can be sold to reuse markets

Today, the share of reusable textiles is around 60% on average for European sorters, and is high enough to ensure a positive operating margin. However, if the share of reusable textiles falls under 45%, sorters' operating margin would become negative, based on current market prices for sorted textiles.[16] This decrease is likely to occur in the coming years,[17] due to:

1 **The expected increase in the volume of separately collected textiles, including those with no reuse value.** In the European Union, separate collection of textiles will become mandatory on 1 January 2025, as per the 2018 revision of the EU Waste Framework Directive. This is expected to result in a higher share of non-reusable textiles entering separate collection systems.

2 **The uptake of circular business models that keep products in circulation for longer.** Citizens participating in these models, particularly peer-to-peer resale platforms, will be less likely to discard their reusable products through separate collection systems, instead reselling them directly to others. This can reduce the volume of reusable textiles entering collection and sorting systems.



Sources: Ellen MacArthur Foundation analysis based on data from Fashion For Good and Circle Economy (2022), McKinsey & Company (2022), EigenDraads (2022)

Where clothing is collected separately, the vast majority is exported.

More than 80% of reusable clothing collected through formal collection systems is exported after sorting (see Appendix C). The global trade in used clothing has increased significantly in the past few decades (see Figure 2).[18] The OECD estimates that roughly one-third of OECD used clothing exports are traded within the OECD, and two-thirds are destined for non-OECD countries.[19] In 2021, OECD countries made up 71% of global used textile exports.[20] A small number of countries contribute to the majority of exports, for example in 2021, 80% of exports were generated by just 16 countries.[21]

In some geographies, vast amounts of textiles are not sorted domestically, but are exported in aggregate for sorting in third countries.[22] For example, recent studies have shown that 55% of textiles collected in the Netherlands are exported for sorting in other countries.[23] In the USA, only a few sorters remain operational within national borders, and the vast majority of collected textiles is thought to be exported for sorting in Central- and Latin-America.[24]

The global used clothing trade leads to a disproportionate waste management burden on importing countries. While reuse exports lead to increased value capture and utilisation of clothing, they also cause a disproportionate waste management burden on importing countries, which often lack the infrastructure to manage clothing when it is no longer reusable. In Ghana, for example, the importation of used clothing increased by 140.5% between 2000 and 2021,[25] while waste management infrastructure for textiles has remained stagnant.[26] The lack of infrastructure to manage textiles after their use phase often results in the incineration, destruction, and landfilling of textile products, losing the intrinsic value of the materials embedded within them. In Tunisia 8.7% of the solid waste disposed of in landfills is textiles, almost as high as the share of plastic waste (9.4%).[27]

While used clothing is traded for reuse, not all used clothing is reused in practice. A proportion of imported clothing is never sold to consumers due to limited demand or low quality. This means that a proportion of clothing imports become waste 'on arrival'.[28] In today's system, there are no standardised sorting processes or outputs, and we lack a common language to understand the categories and qualities that discarded textiles can be sorted in. This leads to a general lack of visibility and reporting on the outputs of sorting processes, for example as to the share of reusable versus non-reusable textiles collected. In practice, this means that importers of textiles lack the ability to monitor, inspect, and report on the market value of the products they receive.

The global trade of used clothing has economic and social consequences for workers in sorting, grading, and reuse sectors, in particular in importing countries. Today's global reuse economy is an industry of precarious employment and small profit margins.[29] In importing countries, sorters, graders, traders, and sellers of reusable clothing deliver a significant contribution to the circular economy, but they largely do so in precarious work conditions, and for a low income. As informal workers, they generally experience job uncertainty and instability, which is heightened by improperly sorted textiles. Profitability is severely challenged when a proportion of the bales imported as reusable clothing is not sold due to low quality, inexistent market demand, stains, or damage. The volatility and uncertainty of jobs in the used clothing trade has been widely documented, and predominantly affects women.[30]

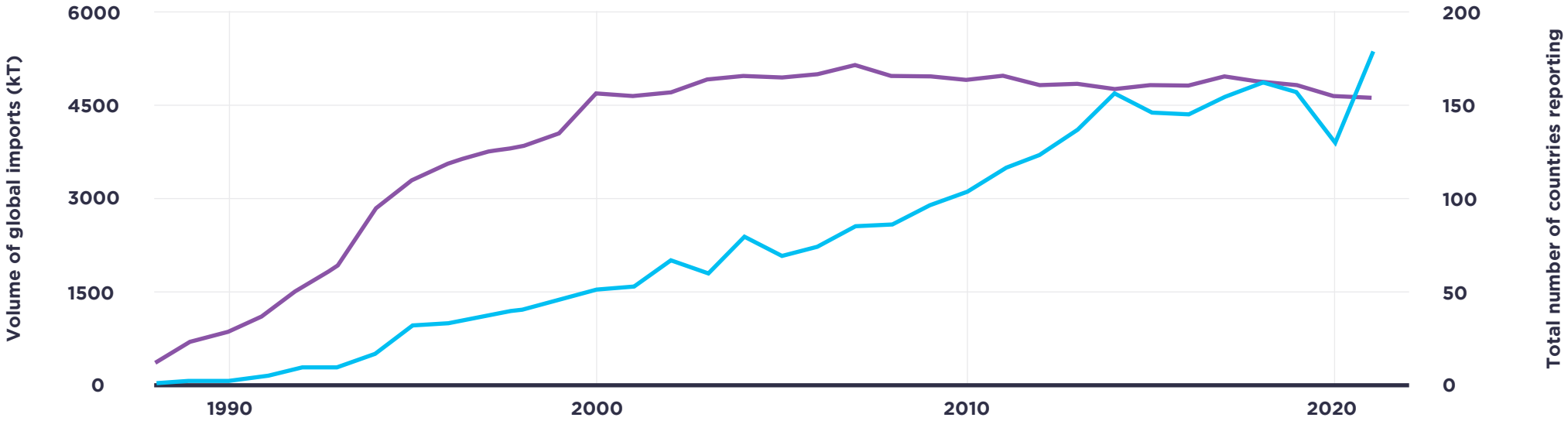
Figure 2

Historical overview of the global used textiles trade

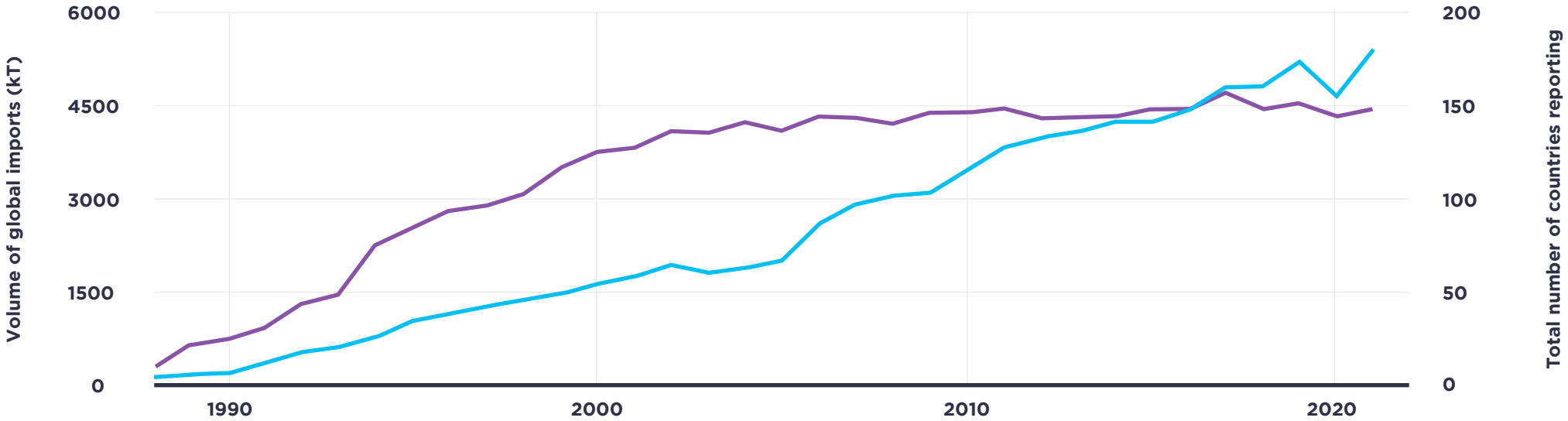
Number of countries reporting

Volume of imported textiles

Global imports of used textiles



Global exports of used textiles



To fix this leaky system, the economics for separate collection need to stack up.

The current economic model for collecting discarded textiles faces significant pressure. Across different geographies, textile collectors and sorters currently report challenging profitability (see Figure 3). With more and more new items of clothing being placed on global markets, resale markets are becoming increasingly saturated. At the same time, collectors widely report a decline in the quality of the products they receive, which diminishes their suitability for resale and reduces their selling price.[31] In Europe, sorters are widely reporting financial strains, attributed to a mix of factors including a global drop in sales and global trade disruptions, such as the Red Sea shipping crisis, resulting in increased freight costs and longer delivery times.[32]

Market demand for recycled textile inputs remains limited. In addition to a difficult resale market, the economics for separate collection and sorting are further challenged by a limited demand for textile recycling. When discarded textiles are worn out, damaged, or stained, they are generally considered unsuitable for reuse. Today, these products are usually downcycled into lower-value applications, such as insulation material, wiping cloths, or mattress stuffing. Recycled content from textile sources is minimal. As an example, almost all recycled polyester is from recycled PET bottles and not recycled polyester.[33] The economics are further challenged by the cost of landfill and incineration, as not all collected textiles can be reused or downcycled. In geographies with limited incineration or landfill capacity, this can lead to textiles being abandoned in the environment, which impacts local communities, as it causes soil degradation and pollution of waterways.

To establish separate collection systems at scale, structural funding is needed to cover the net cost associated with managing all discarded textiles, not just the fraction with high market value. Where separate collection systems are in place, they are largely funded through the reusable clothing fraction, which is traded all around the world. This market-driven system faces significant pressure, and will not achieve further expansion nor material capture unless dedicated funding is put in place to cover the cost.

Figure 3

The business case for sorters in Europe, Kenya, and India

While sorters are able to turn a positive operating margin for reusable clothing, the non-reusable clothing fraction (sold to downcyclers or recyclers) is operating at a loss, based on current market prices. See Appendix E for a detailed breakdown of the values reported in this figure.

Low transparency on product and material flows creates a number of challenges.

Material flows in the textile waste stream are complex, opaque, and transboundary. Textiles flow across borders after use, at times crossing dedicated economic zones for sorting and processing, and may be exported several times within one product's lifetime. We currently lack crucial insights into these global material flows and where discarded textiles ultimately end up, when they are no longer deemed suitable for reuse or recycling. The available reporting across locations is scattered, inconsistent, and incomplete, making it largely unreliable for comprehensive analysis and decision-making. While commodity codes allow for some traceability of internationally traded textile products, these are difficult to analyse and lead to a fragmented understanding of the scale of the trade, as they typically do not cover transit hubs nor trade spanning across multiple countries.

To build a circular economy for textiles, accurate reporting and measurement is needed. Governments have long overlooked textiles as part of municipal waste management regulations, because donated or discarded textiles have often not been classified as waste. Many governments have only recently begun to measure textile waste volumes. Few have set targets on the collection, reuse, or recycling of textiles. In most countries around the world, businesses are not required to report on the products they place on the market, nor on where these products may end up after first use. Collectors and sorters are often not required to report the tonnages they collect, and composition analysis of the textiles they collect and sort is carried out episodically, as part of time-bound projects, but not in a structural manner. The non-profit and informal sectors play a significant role in textile recirculation but are usually not accounted for in official data, leading to further fragmentation. As a result, collection processes and their performance remain poorly understood.

Achieving common definitions of "waste" versus "product" is a crucial step to achieve recirculation systems for textiles at a global scale (see Box 4). Today, national and regional scope definitions[34] of "textiles" and "textile waste" vary widely. The Harmonized System, a legal instrument that classifies 98% of global trade, foresees two codes pertaining to used textiles: code 6309 — worn textiles and clothing, and code 6310 — sorted and unsorted used rags and textile scraps. In general, code 6309 covers reusable textiles, while code 6310 covers non-reusable textiles that may or may not have been processed into other products (e.g. cleaning rags).[35] However, it is widely assumed that both reusable and non-reusable textiles are traded under the 6309 commodity code, creating a blurry reporting landscape on import and export data of used textiles.[36]

The lack of common language and reliable data presents significant barriers to investment. Only through obtaining access to standardised and reliable reporting data can we begin to understand and map out global material flows for textiles, including disposal pathways and the associated social, economic, and environmental impacts. Such data is crucial to carry out market research and estimate the prospects of investing in reverse cycle activities for textiles, and in building the after-use collection, sorting, and recirculation infrastructure required.

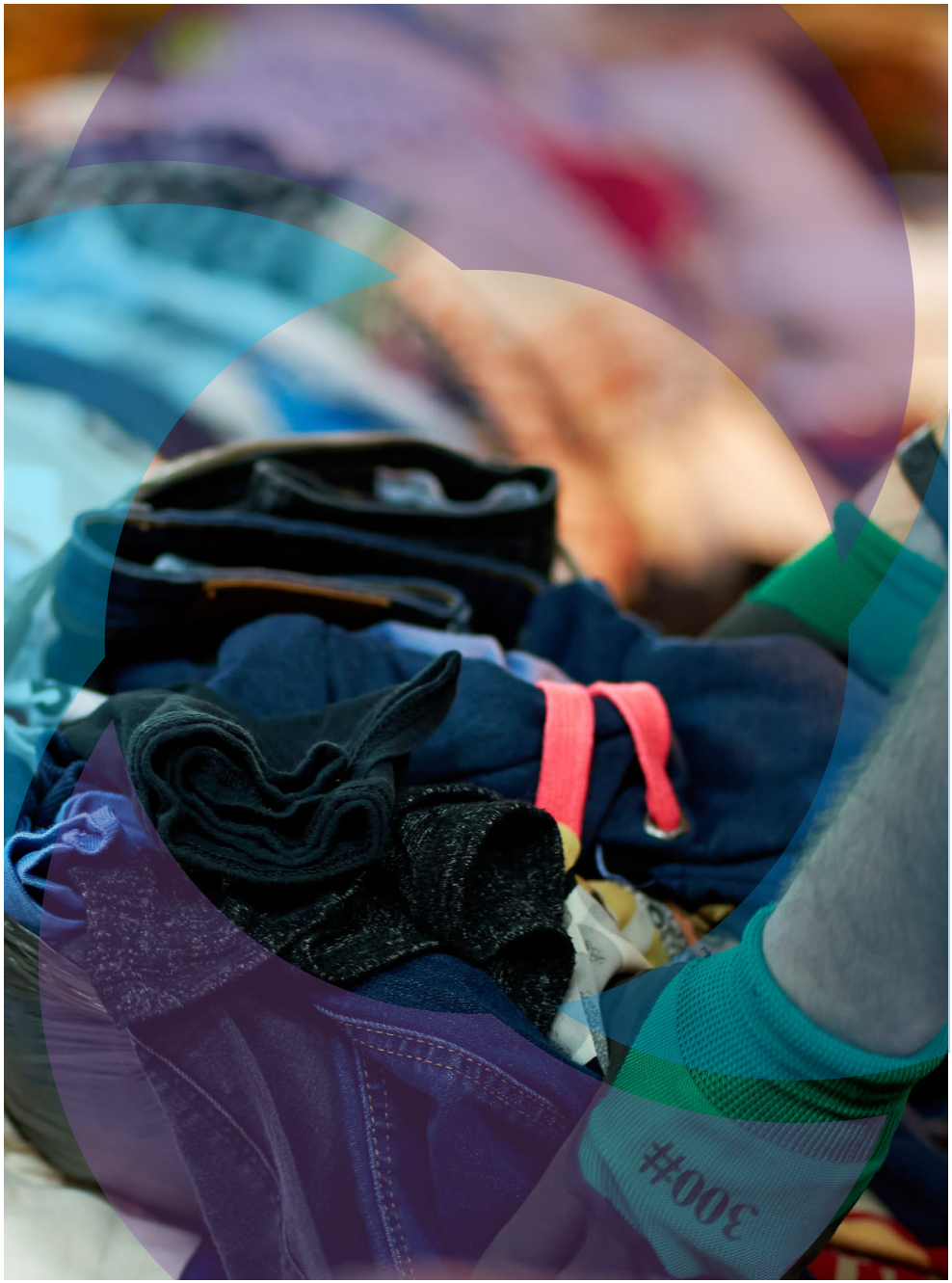
Significant investments are required to collect and recirculate textiles after use.

Significant investments are required to create separate collection, reuse, and recycling infrastructure at scale. The economics and output quality of existing sorting processes and textile-to-textile recycling technologies need to be drastically improved. These investments need to happen alongside industry-focused efforts on scaling circular business models, such as resale, rental, repair, and remaking, which keep textiles in use for longer and decrease the volumes of textiles ending up in separate collection systems in the first place.

Sorting facilities need to expand their operations and need further investment in machinery and equipment. Today's sorting operations are largely built for resale markets and rely on manual labour. They require further investment to deliver tailored feedstocks for textile recycling. This requires the ability to segregate textiles by fibre content, colour, weight, and fabric structure, meeting feedstock specifications for recycling processes in sufficient quantities. It also requires a focus on investment in pre-processing equipment, to remove components that disrupt recycling.

A combination of demand and supply-side measures is needed to deliver textile-to-textile recycling at scale, and drive down the industry's demand for virgin resources. Over the last few years, brands and retailers have publicly committed to circular economy targets which — among other measures, such as the adoption of circular business models — include the use of post-consumer textile-to-textile recycled content in all their products.[37] However, today's available supply of post-consumer recycled content is much smaller than the amount required to meet these commitments[38] and recycled textile fibres are almost always more expensive than virgin fibres.[39]

Spending on infrastructure should be a balancing act, examining short-term needs and longer-term considerations. While the above estimates are helpful to understand the scale of the investment needed if material consumption were to stay at current levels, it is important to stay focused on the need to bring down volumes of discarded textiles over time. Infrastructure investments should consider the ambition to achieve a circular economy, in which products and materials are kept in use and waste is prevented at source, to avoid lock-in effects or stranded assets in the future.



Transforming the textiles system requires a collective solution, supported by mandatory policy.

To make the economics work for separate collection, sorting, reuse, and recycling, a collective solution is required, based on mandatory policy. Voluntary business action plays a crucial role in innovating and showing what is possible, but in itself it is not sufficient to deliver transformative change. Reliance on voluntary action, in the absence of direction-setting policies, leads to a fragmentation of efforts across the industry. The reality is that when action is voluntary, it fails to create a level playing field and can even discourage businesses from making the investments required, as they fear a competitive disadvantage.

Converging efforts on circular product design is a crucial step in scaling up reuse and recycling, but the lack of harmonisation has slowed down progress. Common approaches and ambition levels on durability, recyclability, and material selection (including blends) are required to build systems that can keep textile products and materials in use for as long as possible. Policymakers have an important role to play in building common standards, underpinned by a robust evidence base. For example, product policies can drive alignment on a minimum ambition level and can help overcome information gaps between product design and what happens at the end of a product's first use phase.

Alongside product design, sharing infrastructure is key as it provides economies of scale. Circular business models for textiles often encounter economic challenges due to the labour-intensive and inefficient nature of today's collection and sorting systems for textiles after use. Today's supply chain and infrastructure — which were originally designed for a one-way flow of products from design to use to waste — need to be transformed into a connected supply network with multi-directional transactions. No single actor can achieve such systemic change alone.

Mandatory Extended Producer Responsibility (EPR) policy is a necessary part of the solution. In a circular economy for textiles, businesses contribute to supporting infrastructure, commensurately with what they put on the market, to ensure their products are collected and reused, remade, or recycled into new textile products. EPR is a critical policy lever to make this happen in practice and at scale as it places responsibility on producers with regard to the collection, sorting, and after-use management of the goods they put on the market.

Without mandatory EPR policies in place, it is unlikely that collection and sorting systems for textiles will reach the scale needed to manage the current volumes of textiles in the system. To build a circular system, separate collection infrastructure needs to scale rapidly, with optimised sorting and tracking processes. In a world of finite resources, EPR policy helps create new sectors and employment dedicated to reverse cycle activities, such as collection, sorting, reuse, repair, and recycling. If designed well, EPR policy can significantly improve the cost–revenue dynamics for separate collection, reuse, and recycling, while delivering transparency and collective action towards a circular economy for textiles.

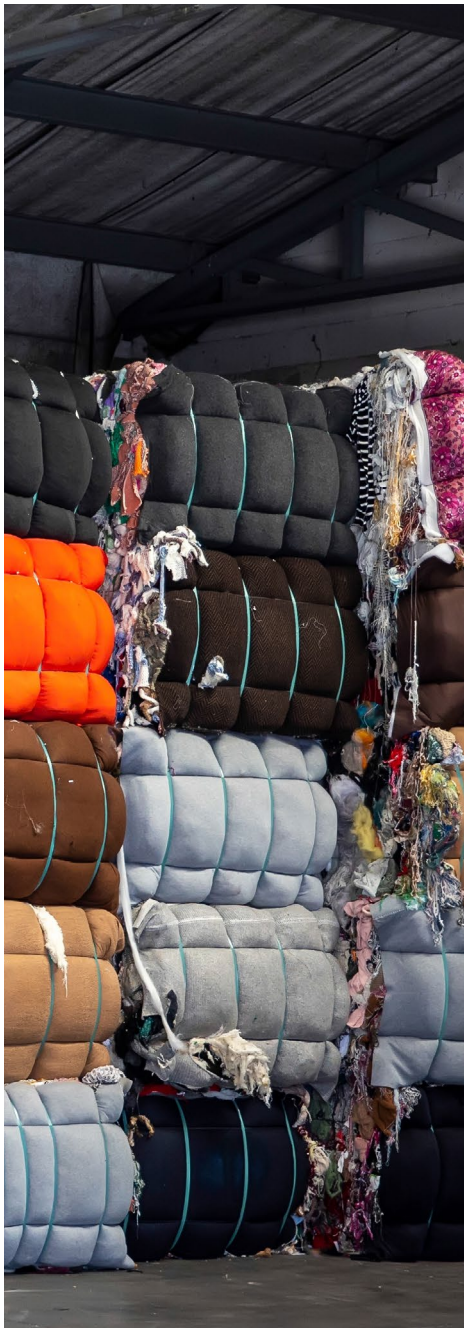
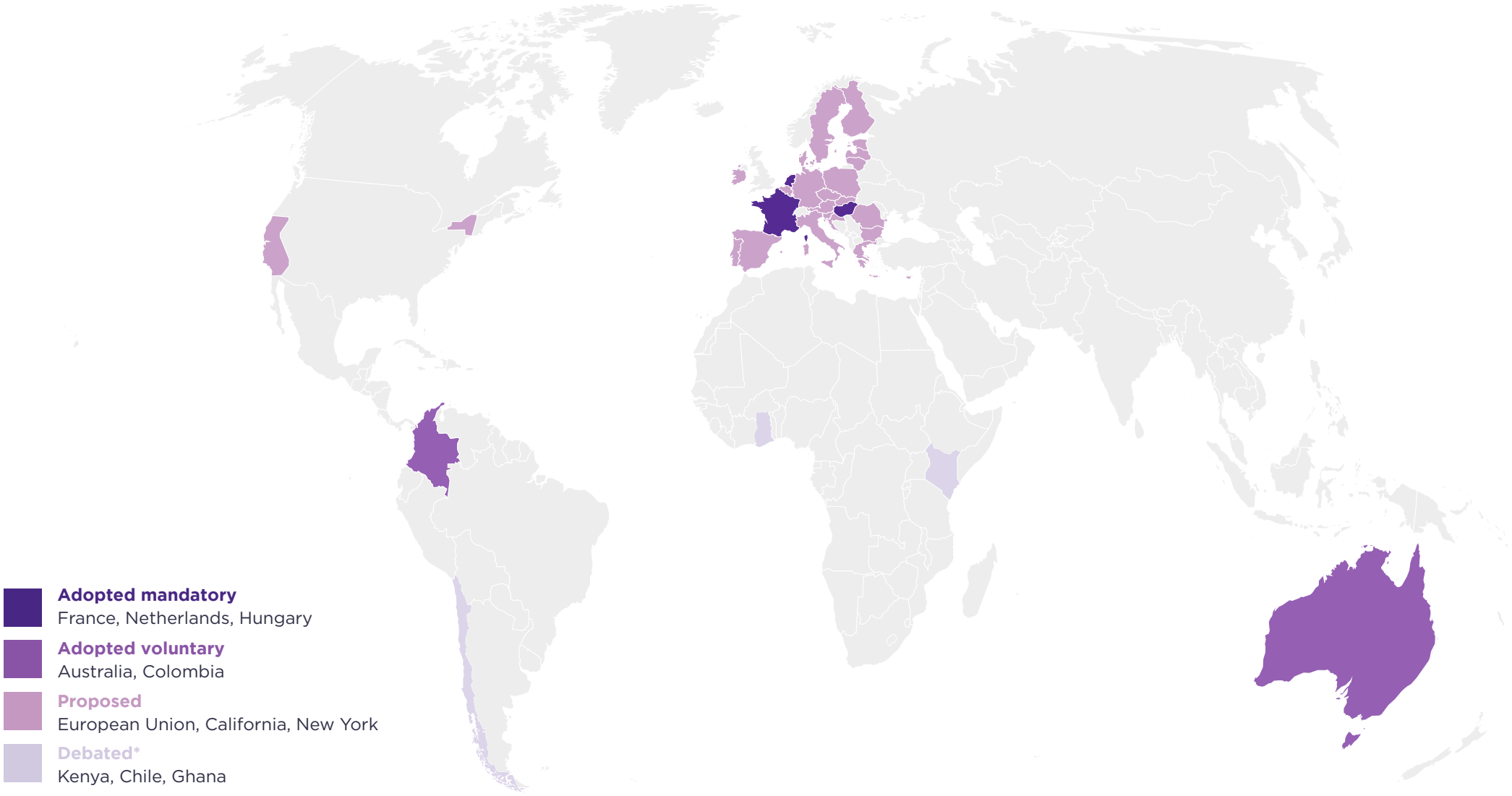


Figure 4

Map of existing and emerging EPR systems for textiles, globally



*Non-exhaustive list

Extended Producer Responsibility: a necessary part of the solution

Mandatory, fee-based EPR is a necessary part of the solution.

The collection and management of used textiles comes at a cost, and this cost is currently higher than the revenues made, as only the reusable fraction is profitable. Any collection scheme aiming to collect all textiles — not just the high-quality, high-value reusable fraction — requires dedicated funding to cover this cost and keep textiles out of the waste stream or, worse, the environment.

Extended Producer Responsibility (EPR) policy is a well-known policy tool that has been widely adopted in a range of sectors, including electronics, packaging, vehicles, and tyres. While it is hard to isolate the impact of EPR policy from the potential effects of complementary policies, the available data[40] indicates that EPR schemes have a positive impact on the collection, sorting, and recycling rates of products in scope.

Mandatory EPR systems are generally found to be more effective than voluntary ones, as they involve better monitoring and enforcement.[41] In comparison to voluntary schemes, mandatory EPR systems have the advantage of targeting the entire industry equally. In addition, research indicates that organisational EPR systems are more effective than financial ones,[42] as they require a stronger involvement of obligated producers in operationalising their responsibilities, resulting in a higher likelihood of covering the full range of costs involved in meeting the targets.

EPR is a necessary part of the solution to build a circular economy for textiles. Over time, the economics can be improved significantly through circular product design, technological advancements, and economies of scale. When textile products are designed for prolonged use and recycling, this will result in significant efficiency gains and cost-per-unit savings for sorting, disassembly, and recycling operations. For many years to come however, mechanisms that ensure dedicated, ongoing, and sufficient funding will be necessary to cover the net cost of managing discarded textiles.

Figure 5

Evidence from the plastic packaging sector:

Collection-for-recycling rates are significantly higher in countries with mandatory EPR for plastic packaging than those in countries with no EPR, as well as with limited or voluntary EPR[43]

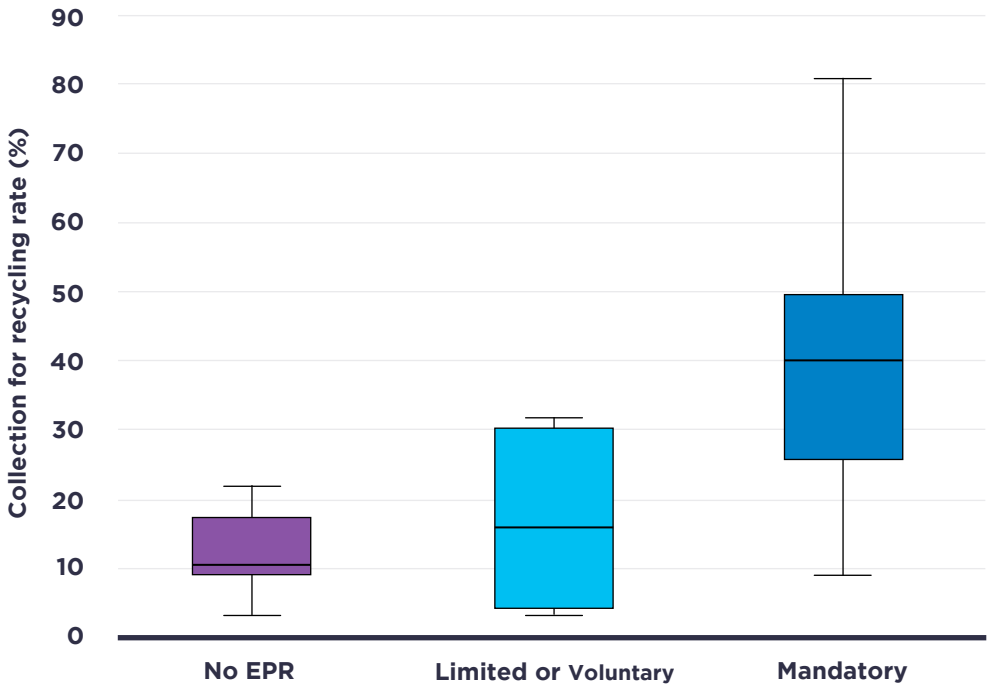


Figure 6

Mandatory, fee-based EPR offers four key benefits

EPR provides dedicated, ongoing, and sufficient funding for separate collection and sorting

EPR spurs collective action towards common targets for collection, reuse, and recycling

EPR attracts capital investments in the infrastructure needed to reuse and recycle at scale

EPR creates transparency and traceability on global material flows

EPR provides dedicated, ongoing, and sufficient funding for separate collection and sorting

Figure 7

Evaluation of various funding mechanisms against the criteria of being dedicated, ongoing, and sufficient

	Dedicated	Ongoing	Sufficient
Public funding through general national or local government budgets allocated towards collection, sorting, and recycling, or disposal.	No	Partially	No
Voluntary funding provided by businesses, philanthropists, or other sources towards voluntary EPR schemes, or any other initiatives to improve the collection, sorting, and recycling of textiles.	Yes	No	No
Mandatory fee-based EPR schemes, as described in Box 2.	Yes	Yes	Yes

If designed well, EPR policy is the only proven pathway to provide funding that is:

- **Dedicated to collecting and processing textile products after use.** Funding is allocated to a clearly defined set of activities (such as collection, sorting, reuse, and recycling of textiles) and cannot be reallocated to other activities.
- **Guaranteed on an ongoing basis** to ensure the continuous operation of a system at the scale and level needed to meet the challenge. This is as opposed to one-off investments, which are inadequate to cover long-term infrastructure development, maintenance, and operations.
- **Sufficient to execute the defined scope of activities.** EPR funding evolves in line with the net cost of operating the system, which may vary according to factors such as changes in the amount of textiles placed on the market, technological innovations, market prices for sorted materials, or progressively evolving objectives.

EPR offers a collective solution to cover the net cost associated with managing discarded textiles. When EPR is mandatory (i.e. contributors cannot opt out), it guarantees an ongoing funding stream. The fees are tied to, and evolve with, the net cost of achieving the targets set out in the EPR regulation (i.e. they are performance-based). As a result, EPR funding is sufficient to cover the costs of managing all textiles in scope.

In particular, EPR policy helps achieve more accurate and granular sorting operations. In today's system, small margins often mean that sorters cannot afford to create a highly accurate and granular segregation of discarded textiles into different degrees of quality, material purity, material types, colours, and other specifications. Improper sorting negatively affects the economics of actors down the chain, and ultimately leads to textiles ending up in landfill and incineration, due to the absence of a reuse or recycling market. Improved sorting is a key enabler for scaling reuse and recycling economies, and generates important employment opportunities, as sorting is expected to remain labour-intensive for the foreseeable future.

EPR attracts capital investments in the infrastructure needed to reuse and recycle at scale

The establishment of mandatory EPR policy can unlock capital investments in the infrastructure required to collect, process, and recirculate discarded textiles. While EPR schemes and related fees cover operational expenditures, they also create the right enabling environment and build confidence for capital expenditures in long-lived assets, such as collection infrastructure and automated sorting facilities. In countries where existing infrastructure is insufficient to meet targets set by the EPR scheme, PROs have commonly invested — often by sharing the investment with private sector operators — in bins, trucks, sorting equipment, and recycling facilities to meet EPR targets in sectors such as packaging, vehicles, tyres, oils, and electronics.[44]

Crucially, by covering the costs of separate collection and sorting, EPR policy creates investor confidence in the market opportunity for reuse and recycling. EPR policies significantly improve the economics for sorters in particular, who currently face profitability challenges. This means the rationale for reuse and recycling is much stronger, as sorted feedstocks are delivered at a low cost. In addition, because they are legally required to meet EPR targets on collection, sorting, reuse, and recycling, brands and retailers (often organised in PROs) engage in lasting contracts with private operators, guaranteeing the operators a minimum number of years of operations, and therefore steady returns on their investments.[45]

By driving an increase in collection rates, sorting capacity, and therefore the availability of good-quality textile feedstocks, EPR policy can create the stability of supply and economies of scale needed for investments in large-scale assets.[46] Without a growing and consistent availability of high-quality feedstock for textile-to-textile recycling, it is not possible for sorters and recyclers to invest in capital-intensive assets, such as buildings and machinery, that are required to increase their processing capacity. According to a National Institute of Standards and Technology (NIST) report, US recyclers need to be assured of collecting 35 kilotonnes of textiles per year in order to invest the USD 20–25 million needed to build a new plant.[47]

EPR creates transparency and traceability on global material flows

EPR policy creates improved transparency and traceability with respect to textile products placed on the market and the pathways these follow when they are discarded. EPR policy mandates industry-wide reporting on products placed on the market. Reporting by obligated producers creates visibility on the collection, reuse, and recycling rates, as well as the fraction that ends up in final disposal. In this way, EPR creates the transparency that is crucial for governments and businesses to measure progress and take more informed and targeted actions and decisions.[48] For example, the French EPR scheme for textiles has heavily invested in compositional analysis of non-reusable textile waste,[49] in order to understand the typology of textiles that could enter recycling processes. This understanding is crucial to inform the development of more targeted solutions, for example by adapting eco-modulation criteria to favour recyclable textiles over non-recyclable ones, or by informing R&D funding decisions to accelerate the development of new recycling technologies.

EPR spurs collective action towards common targets for collection, reuse, and recycling

Mandatory EPR regulations offer a framework for setting and enforcing legally binding targets on operations such as collection, sorting, reuse, and recycling, as well as waste prevention and reduction. When targets are legally binding, they create confidence and stability for long-term planning and investment. This way, brands, retailers, manufacturers, collectors, and sorters operating in the same market can all work in a concerted manner towards the achievement of set targets and objectives, and can measure progress against a shared framework of targets and metrics.

Setting and incentivising strong circular economy targets, based on the polluter pays principle,[50] can disincentivise today's linear approach to managing textiles, particularly products that are discarded before the end of their useful life. By putting a price on waste generation and pollution through the use of fees, EPR is a key mechanism to internalise these externalities and bring them into the market mechanism, providing a powerful incentive to help level the playing field for circular business models.

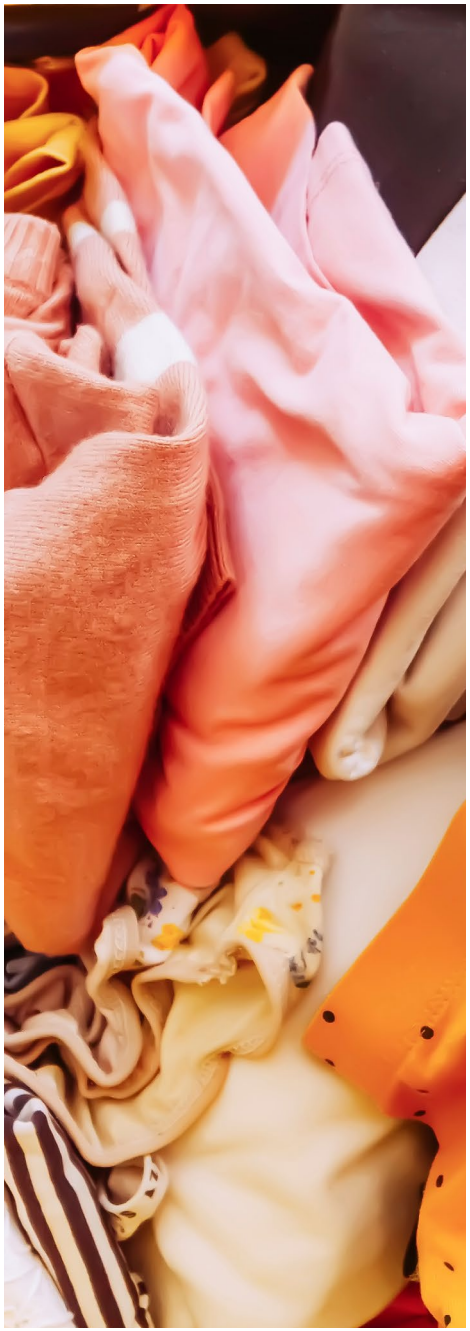
EPR policy design: a common direction of travel

Achieving a widespread uptake of EPR policies, in an aligned manner across borders and jurisdictions, is crucial to build a global circular economy for textiles. Without a coordinated approach, national and subnational EPR policies risk fragmentation and ineffectiveness. Brands and retailers — the obligated producers under EPR schemes — have reach into consumer markets spanning multiple countries, while textile products flow across borders after use. Against this backdrop, a coordinated approach to EPR policy ensures aligned action, reporting, and measurement across governments. Importantly, a common approach to EPR can ease reporting requirements for obligated producers, enhancing compliance and effectiveness of the system in place.[51] This is particularly relevant for SMEs that lack the resources and capacity to navigate compliance across multiple markets.

This report proposes a common approach to EPR policy design for textiles, based on circular economy principles. This approach focuses on aligned definitions, key objectives, and the involvement of stakeholders:

- Establish aligned definitions (including, but not limited to: product scope, obligated producers, cost coverage, and waste hierarchy)
- Aspire to four key objectives, setting national or regional targets for each, including:
  - Increase collection volumes
  - Increase reuse rates
  - Increase recycling rates, and
  - Reduce waste volumes
- Facilitate stakeholder involvement.

The framework proposed in this report is based on key learnings that have emerged from decades of implementing EPR policy in other sectors. It also draws on the EPR systems for textiles that are already in place or under development (see Figure 4). We recognise that establishing EPR provides a starting point, and the policy needs to evolve over time. For systems that are already in place, we recommend exploring pathways to “maximise the opportunity” (see pp.39) and push the boundaries of EPR policy towards transformative circular economy outcomes.



International alignment is key for EPR to be at its most effective. At the same time, such alignment needs to balance the needs of EPR's (sub)national implementation. Collection rates, sorting capacities, and reuse and recycling rates all vary significantly, both nationally and regionally. For this reason, global objectives should translate into specific national, time-bound targets, based on the specific context of implementation. To ensure comparability, these targets should however be based on the same reporting and measurement methods.

EPR policy should be designed to complement and be integrated into existing waste management systems. The conditions and considerations for designing and implementing effective EPR systems differ significantly between industrialised countries with established formal waste management systems and many countries in the Global South where workers in informal and cooperative settings, including waste pickers, constitute a large share of the textile reuse and recycling economies.

Beyond the remit of EPR policy, achieving common definitions of "waste" and "product" would help remove unintended barriers. Today, waste legislation is a key determinant of the pathway of textile products and materials when they are discarded. Waste classifications can enable or hinder activities related to reuse, repair, or recycling. A common understanding around when, for example, a garment or a curtain is a reusable product (suitable for reuse or repair) or instead waste (to be directed to recycling or waste management) is key to enable cross-border resource flows and to support the uptake of circular business models. Agreeing on waste definitions would particularly enable an improved reporting landscape and a more accurate understanding of today's global material flows for textiles (see Box 4).

BOX 4

Achieving common definitions of waste

A prerequisite for establishing an effective mandatory EPR scheme for textiles is to be able to clearly distinguish what constitutes waste and what constitutes a product. Harmonising and simplifying global definitions and applications thereof is key, in order to clearly delineate where EPR obligations begin and end. Discarded textiles travel across the world after collection and sorting, with little clarity about whether they are classified as waste or product. For example, in some countries the separate collection of discarded textiles is officially considered as waste collection, but these textiles can regain their product status after sorting. In other countries, separately collected textiles are not considered waste and therefore always remain a product as per the legal classifications. The designation of "waste" has important administrative impacts, entailing a complex set of legal obligations, different in each jurisdictional context.

It is crucial to redesign and fully mobilise existing international agreements pertaining to waste, in order to set the right enabling conditions for the circular economy transition. In addition, the ongoing negotiations for a legally binding the UN Plastics Treaty offer an unmissable opportunity to develop global rules on waste and pollution for plastics, which will critically influence the development of textile waste policies. Across all these efforts, active involvement and participation from countries that import high volumes of used textiles and other used goods (in particular non-OECD countries) is essential.

Key focus areas include:

1 **Revise the Harmonized System (HS) and relevant HS codes to classify used textiles and textile waste.** The Harmonized System is the legal instrument that is the universal basis for customs tariffs and the international trade statistical system. The HS Nomenclature is currently used by 211 economies and over 98% of global trade in goods is classified in terms of the HS. It is updated every five years in light of developments in technology and changes in trade patterns. To enable a clearer demarcation between the product and waste regimes for textiles,

relevant HS codes pertaining to used textiles (6309 and 6310, see page 20) should be revised and updated. The codes should also align with other global frameworks such as the Basel Convention. Currently, the HS system has 291 distinct six-digit codes covering new textiles compared to one code covering all used textiles and two covering all textile waste. Proposals have recently been made to create codes for upcycled textile products as well as textiles containing recycled content.[52] These proposals should be brought into consideration in the upcoming review cycle carried out by the World Customs Organisation, starting in 2025.

2 **Utilise the Basel Convention to align export and import flows with resource management capabilities.** Adopted in 1989, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is the most comprehensive global environmental agreement on hazardous wastes and other wastes, and has almost universal membership. Recent amendments were made to better regulate the trade in plastic waste and e-waste, while the introduction of a new listing for textiles is currently the subject of debate. Interpretations of the plastic amendments vary and it is currently unclear to what extent existing plastic amendments can be used to restrict the transboundary movement of textile waste that is primarily or fully composed of plastic-based fibres and materials (e.g. buttons). This points to a wider debate asking whether textile waste can be considered a form of "embedded plastic waste", i.e. plastic waste that is "part of used products that have not been dismantled, shredded, or sorted into separate material fractions".[53] In addition, the ubiquitous confusion between "used textiles" and "textile waste" further complicates the debate on how the Basel Convention should address textile waste, as the Convention's mandate applies to waste, and not used products.

For countries to successfully implement obligations under the Basel Convention, continued technical and financial support is critical. Unlike other multilateral environmental agreements, the Basel Convention does not have a stable financial mechanism for capacity-building and technology transfer. To adequately address textile waste under the Basel Convention, capacity and logistical hurdles need to be better understood and addressed, for example in the area of the recently adopted amendments for e-waste and plastic waste. Among other things, efforts are underway to analyse and improve implementation of the Prior Informed Consent (PIC) procedure, and to ease its administrative burden for national customs authorities and administrations.

The Basel Convention can play a significant role in bringing parties together to create necessary clarity on the delineations of "textile waste" and its relationship to "plastic waste". Provided legal clarity is created on these fronts, the Convention can be a powerful tool to impose restrictions on the export and import of those textiles that are contaminated or very difficult to recycle. It can also play a pioneering role by establishing guidelines on the Environmentally Sound Management (ESM) of textile waste. Ultimately however, the Convention's effectiveness depends on the ability of countries to implement and enforce provisions in a coordinated manner, and on the presence of, and alignment with, upstream policy measures that seek to stimulate circular design and to extend the lifetimes of textile products placed on the market.

3 **Establish a Global Waste Observatory, based on an internationally agreed methodology for collecting and reporting waste data.** As outlined in the most recent Global Waste Management Outlook,[54] the lack of standardised measurement and reporting methods on municipal solid waste leads to a fragmented or missing picture of the scale of municipal waste flows. Today, it is impossible to make adequate estimates of the total volume of textile waste generated by households, the share of textiles that is mixed with other waste materials as part of municipal waste, or the share of textiles in controlled landfills or incineration plants. We echo UNEP's call for a Global Waste Observatory which would serve to align measurement approaches and enable better decision-making on waste management services and infrastructure.

EPR policy design: a common approach

This report proposes a common approach to EPR policy design for textiles, based on circular economy principles. This approach focuses on aligned definitions, key objectives, and the involvement of stakeholders in shaping and implementing EPR policy for textiles.

Figure 8

EPR policy design

1. Establish aligned definitions

PRODUCT SCOPE

- Clothing
- Footwear
- Household textiles

OBLIGATED PRODUCERS

- National brands and retailers
- International brands and retailers
- Online brands and retailers

COST COVERAGE

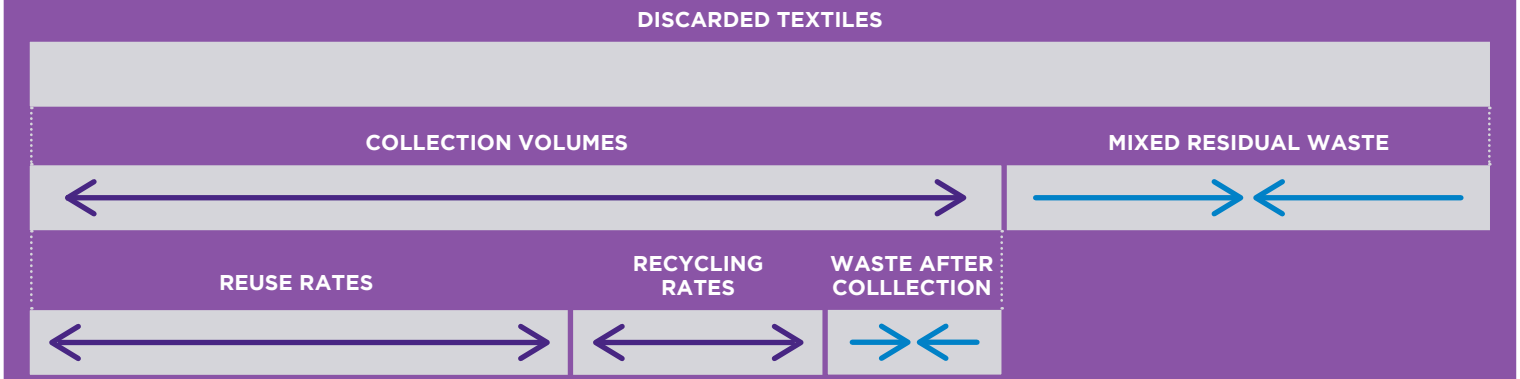
Based on net cost principle:

- Collection
- Sorting
- Preparation for reuse and recycling
- Reuse and recycling

In addition, EPR schemes should cover the costs of:

- Residual waste treatment
- Data gathering and reporting
- Informing citizens
- Administrative costs

2. Set global objectives and (sub)national targets



3. Facilitate stakeholder involvement

1. Establish aligned definitions

Definitions in legal texts are powerful provisions, as they warrant the application of EPR's regulatory framework to the economic and social reality on the ground. Establishing legal definitions that are in alignment across jurisdictional borders can be an extremely significant driver for change, as it enhances transparency, reduces transition costs, removes unintended barriers, and facilitates compliance. In EPR policy, a wide range of concepts, such as "collection", "sorting", "reuse", and "recycling" require clear definitions in the legal framework. By way of example, and with no intent to be exhaustive, this report includes recommendations around the following four definitions:

- **Product scope**
- **Obligated producers**
- **Cost coverage**
- **Waste hierarchy for textiles.**

PRODUCT SCOPE

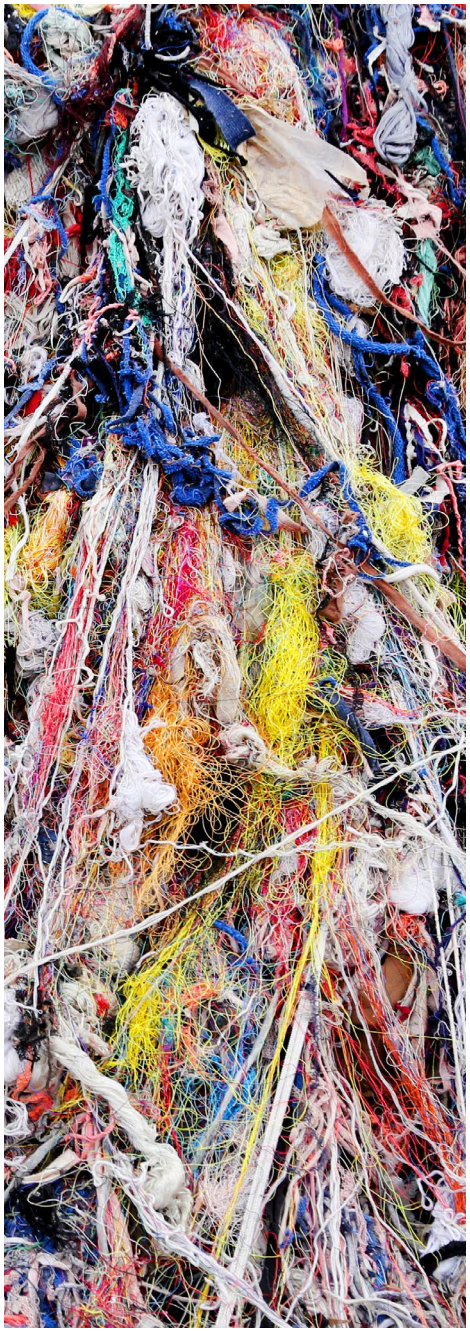
For national textile EPR schemes to be most effective, they should cover all clothing, footwear, and household textiles placed on the country's market. Clothing, footwear, and household textiles can be grouped together in the same product scope, as they are all consumed by households and they largely enter a shared infrastructure for collection and sorting after they are discarded. This scope definition excludes other product categories that also contain textile fibres — such as mattresses, technical textiles, and furniture with upholstery — as they are generally addressed by separate EPR schemes, and require significantly different collection and sorting systems.

To incentivise circular economy approaches, policymakers can consider the inclusion of used (second-hand) products in the scope definition. Including used products in the scope definition helps ensure visibility of what is placed on the market, and helps deliver funding that is sufficient to cover the various collection and sorting cycles these products may undergo. This is particularly relevant for countries that import high volumes of used textiles, in particular clothing.

Where used products are included in the scope, they should be subject to significantly lower EPR fees compared to new products. Considering the relationship between the EPR fee and the sales price of the product (generally lower for used products), and the need to stimulate uptake of reuse business models, used products can be exempted in the short term, until the reuse market gains maturity, at which point they need to be included in the product scope to ensure appropriate waste management financing.

OBLIGATED PRODUCERS

To assign "extended" responsibility, the legal framework should clearly define the actors that are considered "obligated producers" and that are legally required to meet the objectives and targets set out by the EPR policy. This definition should include all actors placing products on the market, including national and international brands and retailers, regardless of their sales channel (physical stores or online). This is crucial to ensure that all products placed on the market are covered, whether introduced by local actors, importers, or online retailers.[55] The definition should clarify in which instances online marketplaces are considered producers.[56] Policymakers could consider de minimis exclusions[57] for individual sellers and micro-enterprises placing products on the market, in particular for second hand (used) products.



COST COVERAGE

Based on net cost principle:

- Collection
- Sorting
- Preparation for reuse and recycling
- Reuse and recycling

In addition, EPR schemes should cover the costs of:

- Residual waste treatment
- Data gathering and reporting
- Informing citizens
- Administrative costs

An EPR system operates on a net cost basis. In principle, the legal framework outlines specific activities and objectives, such as collection and sorting, that need to be undertaken and achieved by obligated producers. The fees are based on the net cost of achieving said objectives. It is important to establish feedback mechanisms, so that costs can be adapted in view of external factors impacting the management of the EPR scheme (such as rising energy costs). If the contributions paid into an EPR system are not sufficient to cover all operations, then it can create a perverse incentive to reduce the volume collected in order to save costs.

As a minimum, EPR fees should cover the net cost of collection, sorting, reuse, and recycling. In addition, EPR systems should cover the costs of managing textiles that are discarded within the municipal solid waste stream. EPR systems should also be equipped to carry out data gathering, reporting, and communication activities, and they should cover relevant administration costs to manage the system. Obligated producers should be involved in the process of setting EPR fees, and have access to a transparent breakdown of them.

EPR systems need to invest in communication activities, to ensure citizens are aware of the opportunity to bring back all textiles, including non-reusable ones. Today, as a result of existing collection schemes focused on reusable clothing, citizens generally believe that textiles should be in good quality and condition to be discarded as part of separate collection systems.[58] To drive up collection rates, it is important to educate citizens and encourage segregation at source, keeping textiles out of mixed household waste.

WASTE HIERARCHY FOR TEXTILES

EPR policy should reflect a clear prioritisation of waste management pathways for textiles, in accordance with the waste hierarchy. Among other things, this should prioritise reuse over recycling wherever possible, as well as a clear priority for textile-to-textile recycling over recycling into other applications. Recycling is an important part of a circular economy, yet the loss of embedded labour and energy, and the necessary costs to make products from their raw materials, mean that it is a lower-value process than reuse, repair, and remaking.

Where recycling is the necessary pathway, keeping recycled outputs within the textiles industry is the preferred option, to stimulate design for recyclability, materials innovation, and demand for recycled inputs. Only where textile-to-textile recycling is not feasible should textile materials be cascaded into other applications and industries as secondary raw materials.

The technological and economic maturity of each recycling method should be considered when prioritising recycling approaches for different textile materials. The circular economy principle of circulating materials at their highest value generally favours mechanical recycling methods for textiles, as they retain the structural integrity of fibres. However, there are a number of key considerations to be taken into account for each method, such as differing degrees of carbon, water, chemical intensity,[59] and varying quality of recycled output.[60]

2. Set global objectives and (sub)national targets

To fully realise the potential contribution of EPR to a global circular textiles economy, a set of global objectives is required, creating a common direction of travel. While these objectives aspire to be globally relevant, national and subnational governments should set specific, time-bound targets for each objective, taking into account policy legacies, infrastructure availability, and the wider stakeholder landscape of their jurisdiction. Targets should be reviewed regularly, enabling policymakers to raise ambition over time.

EPR in itself does not automatically lead to circular economy outcomes — but ambitious targets can. Where EPR schemes are already up and running, consideration could be given to a differentiation of targets across product groups. For example, reuse targets could be higher for jeans and accessories than for footwear, reflecting differences in their respective end markets for reuse. Applying this approach will require a sound reporting feedback loop, enabled by the use of digital product passports or similar traceability mechanisms.

This report recommends the following global objectives for EPR for textiles:

1 **INCREASE COLLECTION VOLUMES**
Increase absolute volumes of discarded textiles that are separately collected

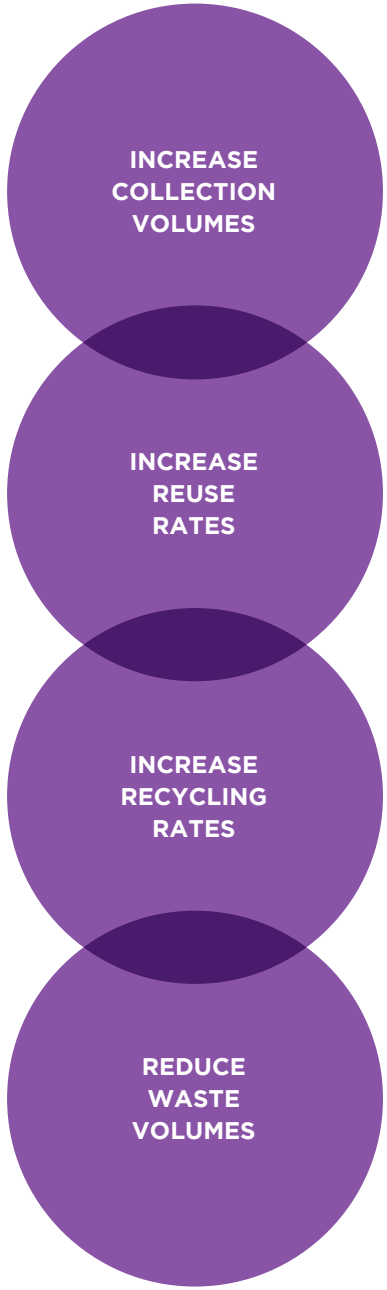
Expanding existing collection systems, and creating new ones where they do not exist, is crucial to divert textiles from mixed municipal waste streams and to avoid leakage into the environment, and the associated environmental, biodiversity, and health impacts. Increased collection plays a critical role in a circular economy for textiles at least in the medium term, until resale and repair business models have been more widely adopted. Over time, targets can be adjusted to reflect improvements in collection infrastructure and in the uptake of circular business models.

Care must be taken when measuring collection rates relative to market placement, in particular when using the results to inform target-setting. In practice, the separate collection rate is usually measured as the rate of textiles being collected relative to the amount of textiles placed on the market in the same or in the preceding year. While this method is helpful to build an understanding of capture rates, it is important to consider the very diverging timelines that may characterise the use phase of textile products — with some items being used for a few days and others for a few decades before being discarded. For this reason, **this report recommends measuring the absolute volumes of textiles collected separately, and setting targets on the absolute increase of such volumes.**

2 **INCREASE REUSE RATES**
Within sorted textiles, increase the share of discarded textiles placed on reuse markets (with local reuse prioritised over exports for reuse[61])

To keep textiles at their highest value, they must be reused to the maximum extent, before being recycled. Practically, this objective can be measured as the share of textiles placed on reuse markets relative to the amount of textiles sorted.

To deliver lifetime extension and to avoid negative externalities associated with the export of reusable textiles, efforts should be made, and targets set, to increase domestic reuse. After collection, reusable textiles are often exported to countries where reuse markets are already saturated, and the infrastructure to manage non-reusable textiles in an environmentally sound manner is limited. To minimise these "pollution transfers", while also minimising the carbon emissions



associated with shipping textiles across borders, EPR schemes should set targets on the minimum share of reusable textiles to be kept in circulation in local (or regional) reuse markets.

3 **INCREASE RECYCLING RATES**
Within the share of sorted and non-reusable textiles, increase the share of textiles placed on recycling markets (with fibre-to-fibre recycling prioritised over recycling into lower-value applications[62])

When reuse is not a viable option — due to textiles being too worn out or the absence of an end market — sorted textiles need to be recycled to keep their material value in the economy. Practically, this objective can be measured as the share of textiles being placed on recycling markets relative to the amount of non-reusable textiles post sorting. It is important to formulate this target in such a way that it does not incentivise textiles being diverted away from reuse markets when they are still in a suitable condition for reuse.

EPR objectives should reflect a clear priority for textile-to-textile recycling[63] over downcycling and cascading into lower-value applications. This could be reflected in a target on the minimum percentage of non-reusable textiles that is sent to textile-to-textile recycling relative to the total amount of non-reusable textiles, with the percentage increasing year-on-year as textile recycling capacity scales up. This is crucial to help decouple production from the use of virgin resources, and to send a demand signal for solutions that deliver ease of disassembly and recyclability by design. To further support this priority in practice, investments should be made into innovative sorting operations (capable of segregating materials in a cost-efficient manner) and recycling processes for blended textiles.

4 **REDUCE WASTE VOLUMES**
Reduce the overall volume of textiles entering landfill, incineration, or leaking into the environment

The establishment of EPR policy and the above three objectives should lead to a decreasing share of textiles entering final disposal over time. Specifically, increased collection rates directly reduce the amount of textiles that are landfilled or incinerated as part of mixed household waste; and ambitious reuse and recycling targets directly reduce the amount of collected textiles for which (controlled) disposal is the only option.

This reduction in waste needs to be measured in practice, against time-bound reduction (or diversion) targets. Measuring, and reporting on, waste reduction in absolute numbers is key to understanding progress. Practically, this can be achieved by regularly carrying out compositional surveys of the collected mixed waste from households, as well as through compositional research within landfill sites and incineration plants.

3. Facilitate stakeholder involvement

The design of EPR policy needs to consider the inclusion of the non-profit sector (charities and social enterprises) as well as the informal sector. EPR policy presents a significant opportunity to bring together circular economy and social objectives. For example, specific financing mechanisms can be put in place to support social and solidarity enterprises, as is the case in the French EPR system for textiles.[64] To ensure inclusive EPR operations, the legal framework should ensure that PROs carry out open and transparent tendering processes.

Workers in informal and cooperative settings, including waste pickers, play a critical role in facilitating the collection, sorting, reuse, and recycling of textile products and materials. In precarious conditions, they help draw more value out of textiles, but do so against the grain of a linear system that often means products are not designed for prolonged use. Importantly, informal workers often face a lack of recognition and an unstable labour market, as well as needing to rely on rudimentary equipment.[65] The informal and unregulated nature of this work can pose concerns relating to the health of the workers involved, as well as the health of surrounding populations, due to exposure to potentially hazardous substances within textile products, such as heavy metals or water repellents.

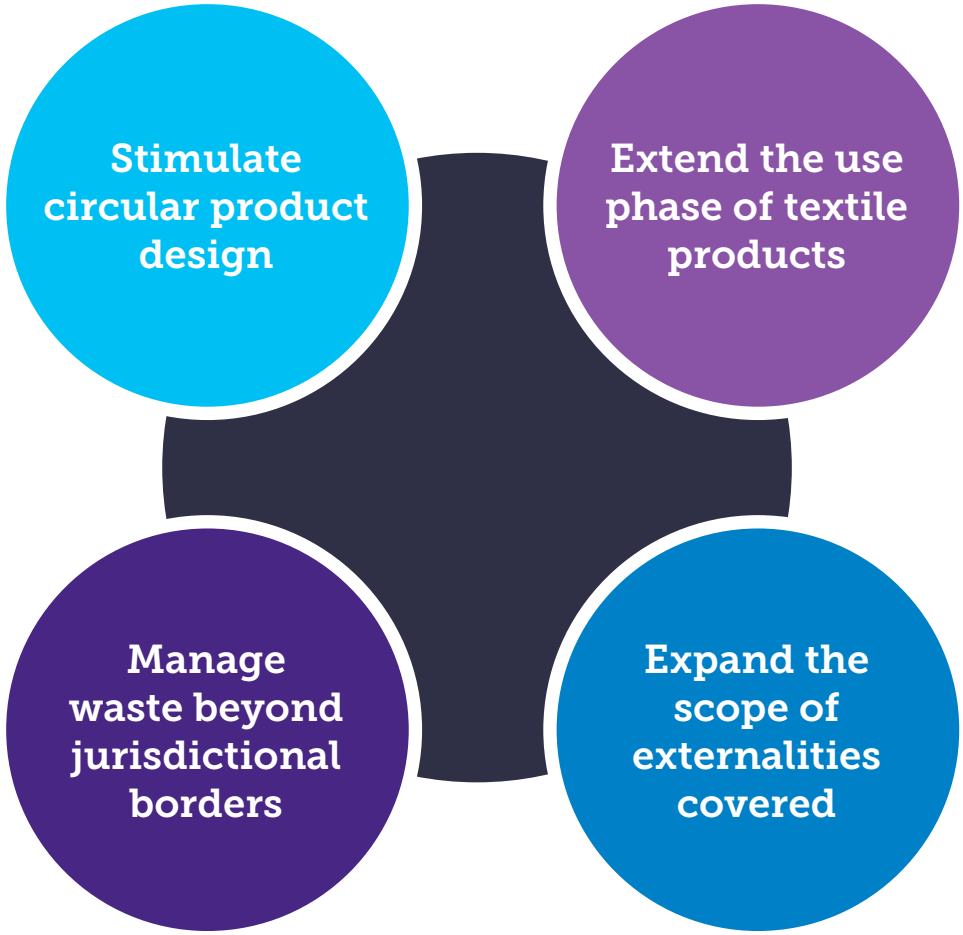
To deliver ambitious outcomes, EPR policy should be designed to complement and align with existing, largely informal waste management systems. It is important that the process of designing and implementing EPR policy includes participation from public authorities and municipalities, waste management service providers, and organisations representing workers in informal and cooperative settings, such as waste pickers. Among other things, the process should include due consideration on payments for services provided by informal workers, and should establish mechanisms to facilitate registration.[66] Relevant factors also include access to health services, a guaranteed monthly income, and improved working conditions.[67] As an example, in Chile, informal workers and waste pickers can register and formally take part in the EPR scheme under the 2019 EPR Decree for Packaging. Local authorities and informal waste pickers and recyclers have preferential status in the tender procedure to reach certification and registration.[68] In addition, PROs are legally obliged to provide training and financial support to promote the inclusion of informal waste pickers and recyclers.[69]

Maximising the opportunity: designing EPR for a circular economy

EPR policy is a starting point and needs to evolve over time to deliver circular economy outcomes. Designed as a waste management policy tool, EPR has historically focused on the end-of-life stage of the products in scope. EPR was not originally designed to cover the entire waste hierarchy, such as waste prevention and reuse.[70] In practice, this means that EPR has led to increased collection and recycling rates,[71] while its impact on product design has remained limited.[72] In the packaging sector for example, where EPR is most established, EPR legislation did not historically challenge the short-lived and single-use nature of a wide range of packaging applications.

In its current form, the implementation of EPR policy is incomplete, as producer responsibility stops at the point of export. When products are exported for reuse, the burden of their eventual waste management is transferred to a different jurisdiction, with no commensurate transfer of financial or technical support to do so. So far, because EPR policy is generally tied to the jurisdiction in which it is implemented, it has been unable to support waste management when this occurs elsewhere. To achieve a circular economy on a global scale, the idea of extending EPR beyond jurisdictional borders should be explored further.

EPR has the potential to break away from its traditional downstream focus and deliver circular economy outcomes. This potential is currently underexploited. To ensure ambitious circular economy outcomes for EPR for textiles, policymakers can explore opportunities to:

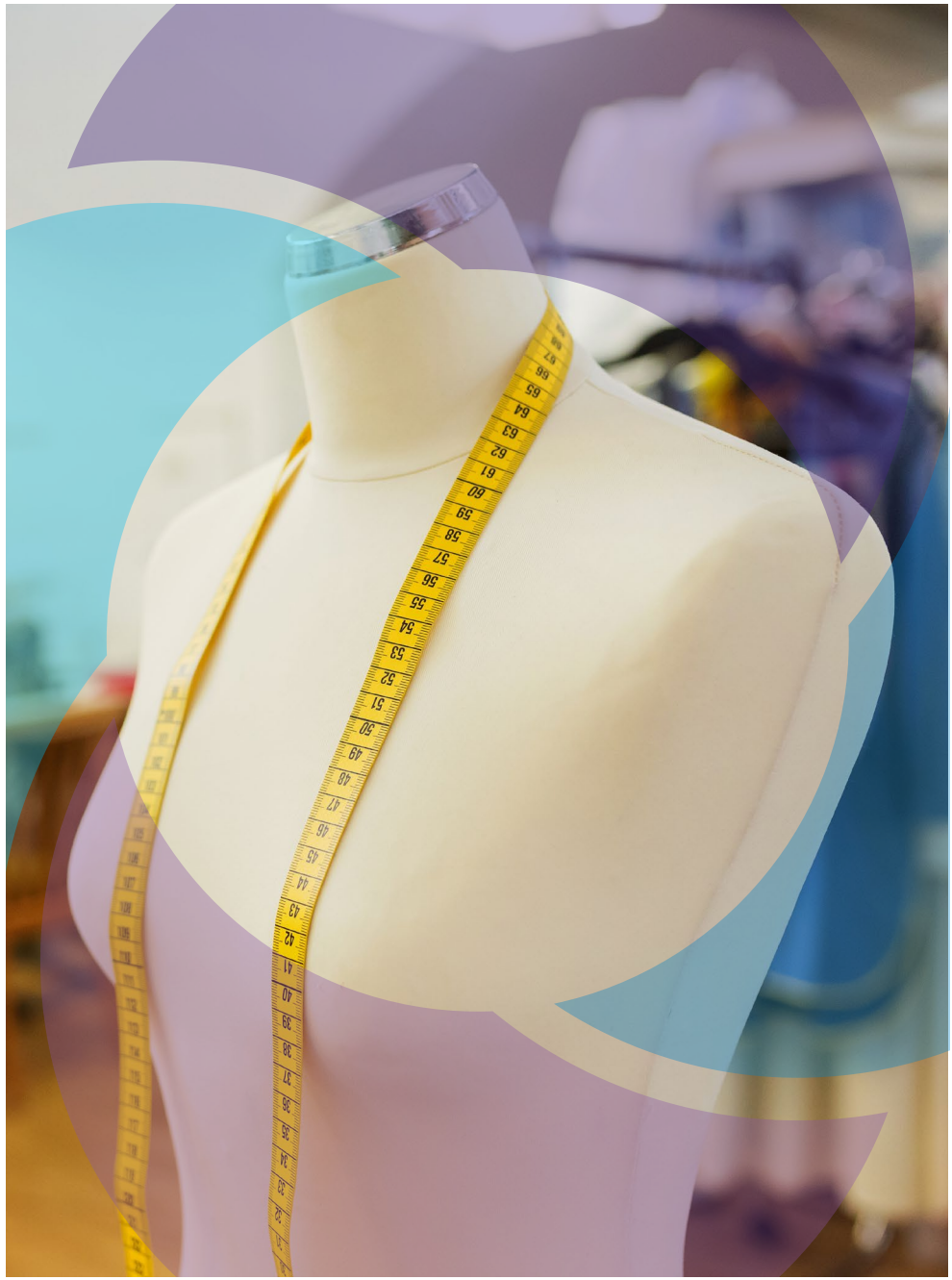


Stimulate circular product design

Through the introduction of differentiated fees,[73] EPR policy can stimulate circular product design, impacting crucial decisions on product performance and material choice. Fee differentiation allows for lower fees for products that meet circular design criteria, including aspects such as durability, recyclability, ease of disassembly, and inclusion of post-consumer textile-to-textile recycled content. Conversely, obligated producers pay higher fees when they place products on the market that do not meet these criteria.

Fee differentiation can only be impactful when the fees are sufficiently ambitious. EPR fees need to give clear market signals and therefore need to be sufficiently high in proportion to the sales price or manufacturing cost.[74] For example, it is argued that in the French textiles EPR scheme, changes in upstream design have been limited due to fees being too small relative to the product's sale price.[75]

Fee differentiation is most effective when based on mandatory product policies, which are part of the wider, regulatory landscape needed to enable a circular economy for textiles.[76] Product policies establish standardised criteria on aspects such as durability and recyclability, setting a baseline ambition level that all industry players need to meet when placing products on the market. Aligning product policy criteria with those for fee differentiation in EPR schemes can create maximum impact, encouraging businesses to go beyond the minimum bar.



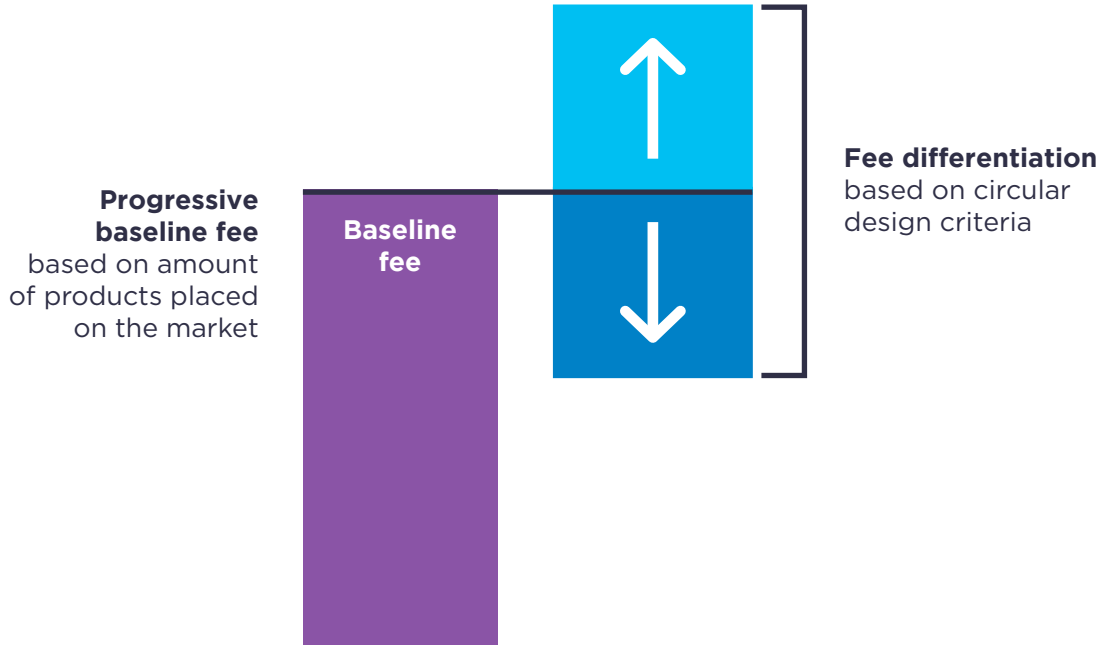
Extend the use phase of textile products

By introducing a progressive fee structure based on the amount of new products placed on the market, EPR schemes can incentivise producers to adopt circular business models — such as resale, rental, and repair — while moving away from linear business models. In addition, applying lower fees to second hand products (compared to new products) can further encourage the uptake of reuse models. As demonstrated by the French EPR scheme,[77] a proportion of EPR revenues can be mobilised to financially support repair operations.

Beyond the fees directly applied by EPR schemes, complementary economic incentives can support the transition to a circular economy for textiles. This includes incentives to include recycled content (for example via product policies), VAT reductions on reuse and recycling activities or machinery, as well as GHG emissions pricing mechanisms. It can also include disincentives for non-circular outcomes, for example through landfill taxes, incineration gate fees, virgin materials taxes, or a textile disposal ban, as has been in place in the State of Massachusetts since 2022.[78]

Figure 9

Illustration of the combination of a progressive fee structure based on the amount of products placed on the market with a differentiation of fees based on circular design criteria



Manage waste beyond jurisdictional borders

In its current form, the implementation of EPR policy is incomplete, as producer responsibility stops at the point of export. As such, when products are exported for reuse, the burden of their eventual waste management is transferred to a different jurisdiction. When these products are discarded after (re)use in a different market than the one they were placed on, the responsibility to ensure separate collection, sorting, reuse, and recycling is not fulfilled, as EPR policies are limited to their jurisdictional context. This gap is particularly relevant in the textiles system: the OECD estimates that roughly one-third of OECD used clothing exports are traded within the OECD, and two-thirds are destined for non-OECD countries.[79]

EPR policy can be designed to manage textile waste beyond jurisdictional borders. The legal framework can stipulate that obligated producers are required to contribute financially to an earmarked fund, which financially supports collection, sorting, reuse, and recycling activities in those countries that the EPR scheme exports significant volumes of reusable textiles to. In practice, this involves including such financial support within the legally defined costs coverage. It also requires agreement between the government and obligated producers on an appropriate mechanism for delivering the funding to countries importing reusable textiles.

A solid legal basis is crucial to ensure effective use of such an earmarked fund, underpinned by reporting. Policymakers need to establish rigorous mechanisms for the identification of countries to which textiles are exported,[80] and the accreditation of entities eligible for receiving funding. Extending EPR across borders would require significant collaboration between governments and PROs, for example when determining ownership of materials and reporting on material flows across multiple countries and transit hubs.

Extending the geographical scope of EPR is not a novel idea: it has been debated elaborately, and tested in practice on a voluntary basis. Academic researchers[81] and NGOs[82] have made elaborate proposals around ways to extend producer responsibility beyond borders ("Ultimate Producer Responsibility") and deliver financial or technical assistance to countries that import used goods, such as electronics and used vehicles. In the European Parliament proposals were recently made to amend the EU Waste Framework Directive to include an analysis of the options to "extend the responsibility of producers to exports of used textiles". Practical examples include the electronics sector, where PROs have delivered capacity-building and training for actors managing e-waste imports.[83]

To achieve a circular economy on a global scale, the idea of extending EPR beyond jurisdictional borders should be explored further. Shifting to a circular economy influences trade flows, increasing the trade of reused products and secondary raw materials. Against this backdrop, the relationship between a network of (sub)national EPR policies and the diverse range of national and international trade policies needs to be better understood. This includes pathways to operationalise collaboration, technical and financial assistance between EPR systems across borders. The interconnection between (sub)national EPR policies and global trade policies has also started to be explored, for example as part of the ongoing negotiations for a legally binding UN Treaty to combat plastic waste pollution.

Expand the scope of negative externalities covered

The textile industry's footprint stretches far beyond the generation of waste. In its current form however, EPR policy predominantly focuses on the externalities arising when products in scope are discarded and become waste. The potential of EPR policy to address other negative externalities remains underexploited. A significant opportunity to correct this course is the modulation of fees to incentivise design change (as explored above).

While product design has a key role to play, not all externalities can be designed out. For example, while product design has a key role to play in limiting microfibre release (e.g. by developing new materials and fabric constructions), it is critical that effective solutions are put in place to capture microfibres when they unavoidably leak out throughout the use phase, in particular during washing. In this context, it is worth exploring a potential expansion of EPR's cost coverage to also finance the removal of micropollutants from wastewater.[84]

In addition, policymakers and experts are exploring the role of EPR to undo the damage caused by products that have leaked into the environment. A recent OECD report has outlined case studies where EPR systems cover the costs of littering as well as clean-up efforts, for products such as plastic packaging and tobacco filters.[85] The ongoing debate on such an extension of EPR is complex, in particular because it is difficult to assign responsibility and trace pollution impacts back to specific products and substances in the case of uncontrolled disposal. Research is needed to understand the extent of textiles leaking into the environment and the associated adverse impacts, and to outline options to remedy pollution caused by products that were placed on the market in the years or decades prior to EPR for textiles coming into place.

Accelerating progress

Policy alone cannot solve the problem of textile waste. As the regulatory process for EPR development takes years to come to fruition, businesses should not wait to make further progress towards a circular economy. Coordinated and compounding industry action is needed to challenge the linear economic model at its core, and to capture the opportunity to reuse and recycle at scale. Committed businesses can make a meaningful difference and the vast majority of businesses can do more than they are doing today.

Investors should recognise the investable opportunities presented by mandatory EPR policy for textiles. EPR policy can lead to multi-year contracts for collectors, sorters, and recyclers, a stable supply of feedstock, and the potential for economies of scale. It can enable a critical leap for the sorting sector, moving from a largely manual process targeting reuse markets to one that delivers customised inputs for textile-to-textile recycling at scale. To support this transition at scale, the finance sector should establish blended finance mechanisms to mobilise private and public capital to improve and automate textile sorting and recycling technologies.

A dual approach of more ambitious, long-term policy change and accelerated voluntary industry action is vital to push progress further, faster. Mandatory policies set a minimum ambition level as a starting point, but to achieve a circular economy, businesses need to demonstrate progress far beyond minimum levels of compliance. Voluntary business action, including the establishment of voluntary EPR schemes, are key to accelerating progress, creating market demand for circular economy solutions. Crucially, voluntary efforts can inform the development of mandatory policies, providing the visibility needed for infrastructure investment and waste management planning, and building confidence in ambitious targets.

Brands and retailers

1 Design products in line with circular economy principles

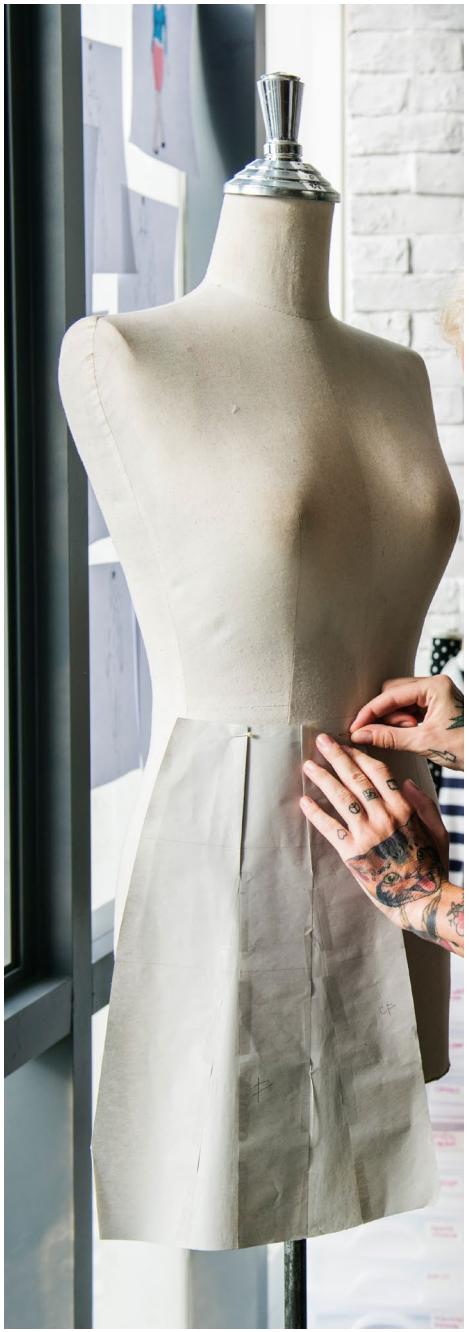
Low durability standards, as well as the variety of materials and blends brought to the market, make it hard for collectors and recyclers to capture the full material value of textiles they receive. The funding raised through EPR schemes risks a loss in effectiveness if brands and retailers do not design and develop products for prolonged use, and for recycling after maximum use. In addition, brands and retailers are uniquely positioned to ensure that where virgin materials are used, they are increasingly sourced from renewable resources, produced through regenerative agricultural practices.

2 Accelerate the adoption of circular business models through collaborative, multi-brand systems

Policy instruments, such as EPR, are far more effective when coupled with industry efforts to move away from low utilisation trends and to pursue circular business models. Circular business models such as repair, rental, remaking, and resale, offer both revenue and cost benefits, and lead to significant environmental savings from increased use and reduced production.[86] While individual brand commitments are a first important step, concrete collaborative commitments towards circular value chains is vital to achieve scale. A circular textiles system requires local and global networks that facilitate services such as collection, sorting, laundry, repair, resale, and recycling. All industry actors need to work together to co-create such a circular supply network, sharing the costs and risks involved.

3 Invest in shared infrastructure that allows for the recirculation of materials after maximum use

Currently, no textile-to-textile recycling operations exist at scale globally. A shared innovation agenda is needed to focus efforts and investments towards recycling technologies for textiles, alongside the adoption of design-for-recycling principles. Brands and retailers have a key role to play to support this emerging landscape, by investing in reverse logistics infrastructure, and by engaging in long-term sourcing agreements with recyclers in order to support the early stages of commercialisation for textile-to-textile recycling.



Technical Appendix

Appendix A

A note on data points in the Technical Appendix:
Data in blue was taken directly from the original source cited
Data in pink was calculated by the Ellen MacArthur Foundation based on the source cited

Calculating the percentage of textiles that leak out of the system when they are discarded

Scope

What we mean by "leak out of the system" (also referred to in this report as "mismanagement"):
Products (in this context, used textiles) that are not recirculated after they have been discarded, either because they are: 1) not separately collected, or 2) separately collected but subsequently end up in landfill (controlled or otherwise), incineration (including waste-to-energy), or dumping (including open burning and littering).

What textiles have been included:
Textile products that are generally in scope of existing or (likely to come under) future EPR obligations, i.e. clothing, footwear, and household textiles such as bed linen.

What we mean by "discarded":
Textiles that are discarded by citizens and enter a form of waste management (waste collection or uncontrolled disposal). These textiles may or may not have reached the end of their useful life at the point of disposal. Generally, we exclude donations of textiles, for example, to charity organisations or second-hand shops, as these pathways typically are not considered waste collection. However, some countries may include these in their reported separate collection volumes. For an in-depth perspective on how textile waste is considered in government reporting in the EU, and the variety of scope definitions and datasets, we recommend reading the European Environment Agency's report "Textile waste management in Europe's circular economy" (2024). The diversity in reporting explains why some countries report a 100% share of discarded textiles that are not separately collected, as this typically covers only conventional waste pathways (e.g. curbside collection) and excludes collection channels for reuse organised by charity or private actors.

What countries have been included as part of our global analysis:
Comprehensive quantitative data on the separate collection and material flows of discarded textiles is not available for all countries across the globe. We have therefore covered countries and regions where quantitative data on the separate collection and the mismanagement of textiles is available (the EU-27, India, and the USA). We have supplemented this with a qualitative description of today's management of discarded textiles for Chile, China, Ghana, and Tunisia.

Assumptions

Calculating the mismanagement of discarded textiles for each country:

- **Where complete quantitative data was available:** *Total share of discarded textiles that are mismanaged (%) = Share of discarded textiles that are not separately collected (%) + [Share of separately collected textiles that are mismanaged (%) / 100 * Share of discarded textiles that are separately collected (%)]*

> **The vast majority (more than 80%) of textiles leak out of the system when they are discarded: they are incinerated, landfilled, or leak into the environment.**

- **Where data only covering separate collection rates was available:** For a conservative estimate, the total share of discarded textiles that are mismanaged has been assumed equal to the share of discarded textiles that are not separately collected.

Separate collection rate:
This report recommends that EPR schemes measure the absolute volumes of textiles collected separately and set targets on the absolute increase of such volumes (as explained in Chapter 4 "EPR policy design: A common direction of travel"). However, in this Appendix, and with the exception of ADEME data for France, separate collection rates have been calculated as the percentage of collected textiles relative to the total amount of textiles discarded by households in the same year, based on available data sources. For France (using ADEME's data), separate collection rate is computed as the percentage of collected textiles relative to the total volume of textiles put on the market in the previous year.

Scope of "discarded textiles" in individual country data:
For some of the countries listed in the table below, the reported figure and its underlying scope definition of "textiles" included textiles from commercial or technical applications and/or did not specify the inclusion of footwear. We have assumed that the rate of collection/mismanagement would not change as a result of the addition or exclusion of these categories. Country data with a different scope of "discarded textiles" include:

- **India:** Data does not specify the inclusion of footwear and includes waste generated from commercial setups, including fabric cuttings from tailors and industrial textile waste (such as soiled and oil-soaked wiping cloths). While these materials are not generated by citizens, they are collected along with the household waste and hence, have been grouped under domestic post-consumer waste.
- **EU-27:** JRC data includes discarded textiles from commercial activities (such as hotels, automotive sector, etc).
- **USA:** The main source of textiles reported as part of municipal solid waste (MSW) is discarded clothing, although other smaller sources include furniture, carpets, tires, footwear, and other nondurable goods such as sheets and towels.

Limitations

Data availability: While this report aims to provide a global overview of the material flow of discarded textiles, the quantitative data required to generate global statistics does not currently exist. Therefore, we have collated the data that is available (primarily from Europe, India, and the USA), and have supplemented this with insights gained from interviews conducted with stakeholders in Chile, China, Ghana, and Tunisia.

Reference years: Due to unavailability of quantitative data for all countries and years, the most recent available reference year (ranging from 2018 to 2022) has been used for each country.

Region	Country	Share of discarded textiles that are not separately collected	Share of separately collected textiles that are mismanaged	Total share of used textiles that are mismanaged	Reference Year	Source
Africa	Ghana	Textiles discarded by households are typically no longer reusable. For these products, there is currently no formal separate collection offered by the waste management services, resulting in the majority of textiles going into the municipal solid waste stream. In addition to households, the import of used clothing leads to the generation of textile waste as a proportion of imported clothing is never sold to consumers due to limited demand or low quality. For example, the Accra Waste Management Services collect approximately 30% of the textile waste generated at Kantamanto market. These volumes, while separately collected, all end up in either landfill or a dumpsite, while the remaining 70% is abandoned in the environment.			–	Ellen MacArthur Foundation interview with Oliver Boachie, Senior Advisor, Ministry of Environment, Science, Technology and Innovation (2024); Accra Metropolitan Assembly, Waste Management Services (2024); Ellen MacArthur Foundation interview with Engr. Solomon Noi, Director of Waste Management Department at Accra Metropolitan Assembly (2024)
	Tunisia	Textiles discarded by households are typically no longer reusable. For these products, there is currently no formal separate collection offered by the waste management services, resulting in the majority of textiles going into the municipal solid waste stream, and entering landfill and incineration. In addition to households, the import of used clothing leads to the generation of textile waste as a proportion of imported clothing is never sold to consumers due to limited demand or low quality. For example, according to a 2022 study conducted by Tunisia's second-hand clothing sector, approximately 24% of the imported used clothing was destroyed in the period 2007-2017, as they remained unsold or were considered waste.			–	Agence Nationale de Gestion des Déchets (ANGED), Management of household and similar waste (2024); Confédération des entreprises citoyennes de Tunisie, Etude économique du secteur de la friperie en Tunisie (2022)
Asia	China	Separate collection systems in China mainly capture reusable clothing. Clothing that is not in a good condition generally ends up in municipal solid waste from households, ultimately ending up in landfill or incineration.			–	Based on research by the Foundation's team based in China.
	India	70%	43%	83%	2019-2021	Ellen MacArthur Foundation analysis based on data from Fashion For Good, Sorting for Circularity: India Wealth in Waste: India's potential to bring textile waste back into the supply chain (2022)

Europe	**EU-27**	78%	25%	83%	2019	Ellen MacArthur Foundation analysis based on data from European Commission JRC, Techno-scientific assessment of the management options for used and waste textiles in the European Union (2023)
	EU-27, Iceland, and Norway	88%	27%	91%	2020	Ellen MacArthur Foundation analysis based on data from European Environment Agency, European Topic Centre, Textile waste management in Europe's circular economy (2024); European Environment Agency, Management of used and waste textiles in Europe's circular economy (2024)
	Austria	70%	–	70%	2020	Ellen MacArthur Foundation analysis based on data from European Environment Agency, European Topic Centre, Textile waste management in Europe's circular economy (2024)
	Belgium	50%	–	50%	2020	
	Bulgaria	99%	–	99%	2020	
	Croatia	91%	–	91%	2020	
	Cyprus	89%	–	89%	2020	
	Czechia	75%	–	75%	2020	
	Denmark	89%	–	89%	2020	
	Estonia	95%	–	95%	2020	
	Finland	100%	–	100%	2020	
	France	76%	–	76%	2020	
		69%	35%	80%	2022	Ellen MacArthur Foundation analysis based on data from ADEME, Tableau de bord - Textiles d'habillement, linge de maison et chaussures (TLC) (2022)

Europe	Germany	82%	–	82%	2020	Ellen MacArthur Foundation analysis based on data from European Environment Agency, European Topic Centre, Textile waste management in Europe's circular economy (2024)
	Greece	98%	–	98%	2020	
	Hungary[87]	100%	–	100%	2020	
	Iceland	100%	–	100%	2020	
	Ireland	99%	–	99%	2020	
	Italy	86%	–	86%	2020	
	Latvia	100%	–	100%	2020	
	Lithuania	92%	–	92%	2020	
	Luxembourg	50%	–	50%	2020	
	Malta	81%	–	81%	2020	
	Netherlands[88]	63%	–	63%	2020	
	Norway	99%	–	99%	2020	
	Poland	100%	–	100%	2020	
	Portugal	100%	–	100%	2020	
	Romania	99%	–	99%	2020	
	Slovakia	94%	–	94%	2020	
	Slovenia	93%	–	93%	2020	
	Spain	96%	–	96%	2020	
	Sweden	95%	–	95%	2020	

North America	**USA**	**85%**	**4%**	**86%**	2018	Ellen MacArthur Foundation analysis based on data from NIST, Facilitating a circular economy for textiles (2022); Environmental Protection Agency, Advancing Sustainable Materials Management: 2018 Fact Sheet (2020)
South America	**Chile**	There is currently no formal separate collection of textiles at the municipal level in Chile. Waste (including from textiles) is mainly disposed of in landfills and formal dumps, in accordance with current regulations.			–	Ellen MacArthur Foundation interview with Tomás Saieg Páez, Chief, Circular Economy Office, Ministerio del Medio Ambiente (2024) and Cadenas de Valor Sustentables (CAV+S), (2024)

Country or Region	Total share of used textiles that are mismanaged when discarded
USA	86%
India	83%
EU-27, Iceland, and Norway (using EEA data)	91%
EU-27 (using JRC data)	83%

Based on this series of data from different regions across the globe, it is possible to conclude that **more than 80% of textiles leak out of the system when they are discarded.**

Appendix B

A note on data points in the Technical Appendix:

Data in blue was taken directly from the original source cited

Data in pink was calculated by the Ellen MacArthur Foundation based on the source cited

Calculating the separate collection rate of discarded textiles and share of discarded textiles present in the mixed Municipal Solid Waste (MSW) stream of selected countries and cities.

Scope

What textiles have been included: Textile products that are generally in scope of existing or (likely to come under) future EPR obligations, i.e. clothing, footwear, and household textiles such as bed linen.

What countries have been included as part of our global analysis: Comprehensive quantitative data on the separate collection rate and share of textiles in the mixed solid waste stream is not available for all countries across the globe. We have therefore covered countries, regions, and cities where data is available. The selected countries used for calculating the global average rate for the separate collection of discarded textiles include the EU-27, India, and the USA.

What we mean by "discarded": Textiles that are discarded by citizens and enter a form of waste management (waste collection or uncontrolled disposal). These textiles may or may not have reached the end of their useful life at the point of disposal. Generally we exclude donations of textiles, for example to charity organisations or second-hand shops, as these pathways typically are not considered waste collection. However, some countries may include these in their reported separate collection volumes. For an in-depth perspective on how textile waste is considered in government reporting in the EU, and the variety of scope definitions and datasets, we recommend reading the European Environment Agency's report "Textile waste management in Europe's circular economy" (2024). The diversity in reporting explains why some countries report a 100% share of discarded textiles that are not separately collected, as this typically covers only conventional waste pathways (e.g. curbside collection) and excludes collection channels for reuse organised by charity or private actors.

What we mean by the share of discarded textiles present in the municipal solid waste stream (MSW): MSW includes all residential and commercial waste but excludes industrial waste.[89] The scope definition for MSW as well as for the notion of "textiles", and how these are reported on, all vary from one country to another and often the analysis is not carried out on a regular basis. Therefore these numbers should be treated as estimates.

Assumptions

Separate collection rate: This report recommends that EPR schemes measure the absolute volumes of textiles collected separately and set targets on the absolute increase of such volumes (as explained in Chapter 4 "EPR policy design: A common direction of travel"). However, in this Appendix, and with the exception of ADEME data for France, separate collection rate has been calculated as the percentage of collected textiles relative to the total amount of textiles discarded by households in the same year, based on available data sources.

> **Where reporting is available, separate collection rates are on average 14% and reach a maximum of 50%.**

For France (using ADEME's data), separate collection rate is computed as the percentage of collected textiles relative to the total volume of textiles put on the market in the previous year.

Scope of discarded textiles in individual country data:
For some of the countries listed in the table below, the reported figure and its underlying scope definition of "textiles" included textiles from commercial or technical applications and/or did not specify the inclusion of footwear. Country data with a different scope of "discarded textiles" include:

- **India:** Data does not specify the inclusion of footwear and includes waste generated from commercial setups, including fabric cuttings from tailors and industrial textile waste (such as soiled and oil-soaked wiping cloths). Although these materials are not generated by citizens, they are collected along with the household waste and hence, have been grouped under domestic post-consumer waste.
- **USA:** The main source of textiles in municipal solid waste (MSW) is discarded clothing, although other smaller sources include furniture, carpets, tires, footwear, and other nondurable goods such as sheets and towels.

Limitations

Data availability:
While this report aims to provide a global overview of the material flow discarded textiles, the quantitative data required to generate global statistics does not currently exist. Therefore, we have collated the data that is available (primarily from Europe, India, and the USA), and have supplemented this with data gained from surveys conducted with the cities of Kyoto, Bogota, Buenos Aires, and Mexico City, as well as with data on the share of textiles present in MSW in Chile and Tunisia.

Reference years: Due to unavailability of quantitative data for all countries and years, the most recent available reference year (ranging from 2009 to 2022) has been used for each country.

Region	Country / City	Separate collection rate	Reference Year	Share of textiles present in MSW relative to the overall MSW waste stream	Reference Year	Source
Africa	**Tunisia**	–	–	**8.70%**	2018	Agence Nationale de Gestion des Déchets, (ANGED), Gestion des déchets ménagers et assimilés (2018)
Asia	**India**	**30%**	–	**3.00%**	–	Fashion For Good Sorting For Circularity: India, Wealth in Waste: India's potential to bring textile waste back into the supply chain (2022); Hasiru Dala Innovations, The Burgeoning Problem of Textile Waste: The Need for Collection, Recycling & EPR (2023)
	Kyoto	–	–	**6.00%**	–	Based on Ellen MacArthur Foundation's survey with Kyoto City Resource Circulation Promotion Section, Environment Policy Bureau (2023)
Europe	**Austria**	**30%**	2020	**5.00%**	2018/2019	European Environment Agency, European Topic Centre, Textile waste management in Europe's circular economy (2024)
	Belgium	**50%**	2020	**4.40%**	2019/2021	
	Bulgaria	**1%**	2020	**5.00%**	2018	
	Croatia	**9%**	2020	**3.70%**	2015	
	Cyprus	**11%**	2020	**7.00%**	2013	
	Czechia	**25%**	2020	**3.10%**	2021	
	Denmark	**11%**	2020	**2.00%**	2019	
	Estonia	**5%**	2020	**5.80%**	2020	
	Finland	**0%**	2020	**6.50%**	2015/2019	
	France	**30.8%**	2022	–	2019	(ADEME), Tableau de bord - Textiles d'habillement, linge de maison et chaussures (TLC) (2022)

Europe	**France**	**24%**	2020	**3.98%**	2017	European Environment Agency, European Topic Centre, Textile waste management in Europe's circular economy (2024)
	Germany	**18%**	2020	**3.50%**	2017	
	Greece	**2%**	2020	**2.00%**	–	
	Hungary	**0%**	2020	**3.52%**	2018	
	Iceland	**0%**	2020	**3.60%**	2019/2021	
	Ireland	**1%**	2020	**9.30%**	2018	
	Italy	**14%**	2020	**7.50%**	2009/2021	
	Latvia	**0%**	2020	**2.84%**	2021	
	Lithuania	**8%**	2020	**7.30%**	2021	
	Luxembourg	**50%**	2020	**3.89%**	2021/2022	
	Malta	**19%**	2020	**7.00%**	2018	
	Netherlands	**37%**	2020	**4.55%**	2020	
	Norway	**1%**	2020	**6.00%**	2022	
	Poland	**0%**	2020	**6.00%**	2021	
	Portugal	**0%**	2020	**3.78%**	2019	
	Romania	**1%**	2020	**3.00%**	2021	
	Slovakia	**6%**	2020	**5.00%**	2017/2019	
	Slovenia	**7%**	2020	**8.40%**	2020	
	Spain	**4%**	2020	**5.00%**	2010	
	Sweden	**5%**	2020	**3.50%**	2017/2021	

Europe	**EU-27, Iceland, and Norway (Average)**	**12%**	2020	**5.00%**	–	European Environment Agency, European Topic Centre, Textile waste management in Europe's circular economy (2024)
	UK	**45%**	2022	**4.20%**	2021	Waste and Resources Action Programme, Textiles Market Situation Report (2024)
North America	**USA**	**14.7%**	–	**5.80%**	–	Ellen MacArthur Foundation analysis based on data from Environmental Protection Agency, Advancing Sustainable Materials Management: 2018 Fact Sheet (2020); National Institute of Standards and Technology, Circular Economy for Textiles (2022)
South America	**Chile**	–	–	**7.00%**	2018	Based on Ellen MacArthur Foundation's interview with Cadenas de Valor Sustentables (CAV+S), (2024)
	Bogota	–	–	**4.54%**	2022	Based on Ellen MacArthur Foundation's survey with Bogotá, Secretaría Distrital de Ambiente (2023)
	Buenos Aires	**0%**	–	**4.50%**	–	Based on Ellen MacArthur Foundation's survey with The City of Buenos Aires (2023)
	Mexico City	–	–	**2.94%**	–	Based on Ellen MacArthur Foundation's survey with Mexico City, Secretary for Environment (SEDEMA)
Average (computed using the simple average of the two datapoints for France, and excluding cities)		**14%**				

Using the data listed in the table above and acknowledging the limitations outlined above, it is possible to conclude that **the global average separate collection rate is approximately 14%.**

Appendix C

A note on data points in the Technical Appendix:

Data in blue was taken directly from the original source cited

Data in pink was calculated by the Ellen MacArthur Foundation based on the source cited

Calculating the percentage of reusable clothing that is collected through formal separate collection systems and then exported

Scope

What textiles have been included: Textile products that are generally in scope of existing or (likely to come under) future EPR obligations, i.e. clothing, footwear, and household textiles such as bed linen.

What we mean by "sorted textiles": Textiles that, after being separately collected, have been sorted at least once into a 'grade' or 'fraction' e.g. reusable vs. not-reusable.

What we mean by "reusable textiles": Textiles that, after sorting, are considered suitable for reuse and can be sold to reuse markets, either nationally or internationally.

Calculating the share of reusable clothing collected through formal separate collection systems which is exported: *Share of separately collected textiles that are exported for reuse after sorting (%) = 100 * Volume of Separately collected textiles that are exported for reuse after sorting (Tonnes) / Volume of textiles that have been separately collected and sorted as reusable (Tonnes).*

What countries have been included as part of our global analysis: Given complete quantitative data is not available globally, we have used data primarily from the USA and EU-27, which together accounted for 48% of global exports in 2021.[90] We have supplemented this with available data from France and the Netherlands to take into account regional variation within the EU-27.

Assumptions

Scope of discarded textiles in individual country data: For some of the countries listed in the table below, the reported figure and its underlying scope definition of "textiles" included the addition of textiles from commercial or technical applications and/or did not specify the inclusion of footwear. We have assumed that the rate of collection and the quantity of reusable textiles being exported would not change given the addition or exclusion of these categories. Country data with a different scope of "discarded textiles" include:

- **EU-27:** JRC data includes discarded textiles from commercial activities (such as hotels, automotive sector, etc).

> **More than 80% of reusable clothing collected through formal separate collection systems is exported.**

Supplementing data from the UN Comtrade:
Wherever data on reusable exported clothing was unavailable within specific country sources, we have used data from the UN Comtrade under commodity code HS-6309. The Harmonized System, a legal instrument that classifies 98% of global trade, foresees two codes pertaining to used textiles: code 6309 — worn textiles and clothing, and code 6310 — sorted and unsorted used rags and textile scraps. In general, code 6309 covers reusable textiles, while code 6310 covers non-reusable textiles that may or may not have been processed into other products (e.g. cleaning rags). However, it is widely assumed that both reusable and non-reusable textiles are traded under the 6309 commodity code, creating a blurry reporting landscape on import and export data of used textiles. By using data from the UN Comtrade in this calculation, we have made the assumption that all clothing traded under this code is reusable and is not being exported for recycling. Further we have made the assumption that the quantity of discarded textiles exported under HS-6309 has been sorted to some degree to be classed as reusable, despite likely being sent for further sorting in other countries (see Appendix D).

Limitations

Data availability:
While this report aims to provide a global overview of the material flow discarded textiles, the quantitative data required to generate global statistics does not currently exist. Therefore, we have collated the data that is available from the USA, EU-27, France, and the Netherlands.

Reference years:
Due to unavailability of quantitative data for all countries and years, the most recent available reference year (ranging from 2018 to 2022) has been used for each country.

Country/Region	Volume (Tonnes)	Percentage	Percentage expressed relative to	Reference Year	Source
USA					
Separately collected textiles	2,318,058	15%	Discarded textiles	2018	Ellen MacArthur Foundation analysis based on data from Environmental Protection Agency, Advancing Sustainable Materials Management: 2018 Fact Sheet (2020)
Textiles resold prior to sorting	463,612	20%	Separately collected textiles		Ellen MacArthur Foundation analysis based on data from National Institute of Standards and Technology, Facilitating a Circular Economy for Textiles Workshop Report (2022)
Sorted textiles	1,854,446	80%	Separately collected textiles		
Sorted textiles that are reusable	834,501	45%	Sorted textiles		
Separately collected textiles that are exported for reuse after sorting	757,601	91%	Sorted textiles that are reusable		Ellen MacArthur Foundation analysis of the UN Comtrade data (HS-6309)
EU-27					
Separately collected textiles	2,440,000	–	–	2019	Ellen MacArthur Foundation analysis based on data from European Commission JRC, Techno-scientific assessment of the management options for used and waste textiles in the European Union (2023)
Separately collected textiles that are reusable	1,104,000	45%[91]	Separately collected textiles		
Reusable textiles that are exported (exports include both textiles that are destined for reuse and textiles destined for further sorting and export to a third destination country)	916,000	83%	Separately collected textiles that are reusable		

France					
Separately collected textiles	**252,124**	–	–	2022	Ellen MacArthur Foundation analysis based on data from Agence de la transition écologique (ADEME), Tableau de bord - Textiles d'habillement, linge de maison et chaussures (TLC) (2022)
Sorted textiles	**181,420**	–	–		
Sorted textiles that are reusable	**107,945**	**60%**	Sorted textiles		
Separately collected textiles that are exported for reuse after sorting	**102,548**	**95%**	Sorted textiles that are reusable		
The Netherlands					
Separately collected textiles	**115,000**	–	–	2021	Ellen MacArthur Foundation analysis based on data from Rijksoverheid, Monitoringrapportage beleidsprogramma circulair textiel 2021 (2023)
Separately collected textiles that are reusable	**65,000**	**57%**	Separately collected textiles		
Separately collected textiles that are exported for reuse after sorting	**60,000**	**92%**	Separately collected textiles that are reusable		

Using data from the USA, EU-27, France, and The Netherlands, and acknowledging the limitations highlighted above, it is possible to conclude that **more than 80% of reusable clothing that is collected through formal collection systems is exported.**

Appendix D

A note on data points in the Technical Appendix:

Data in blue was taken directly from the original source cited

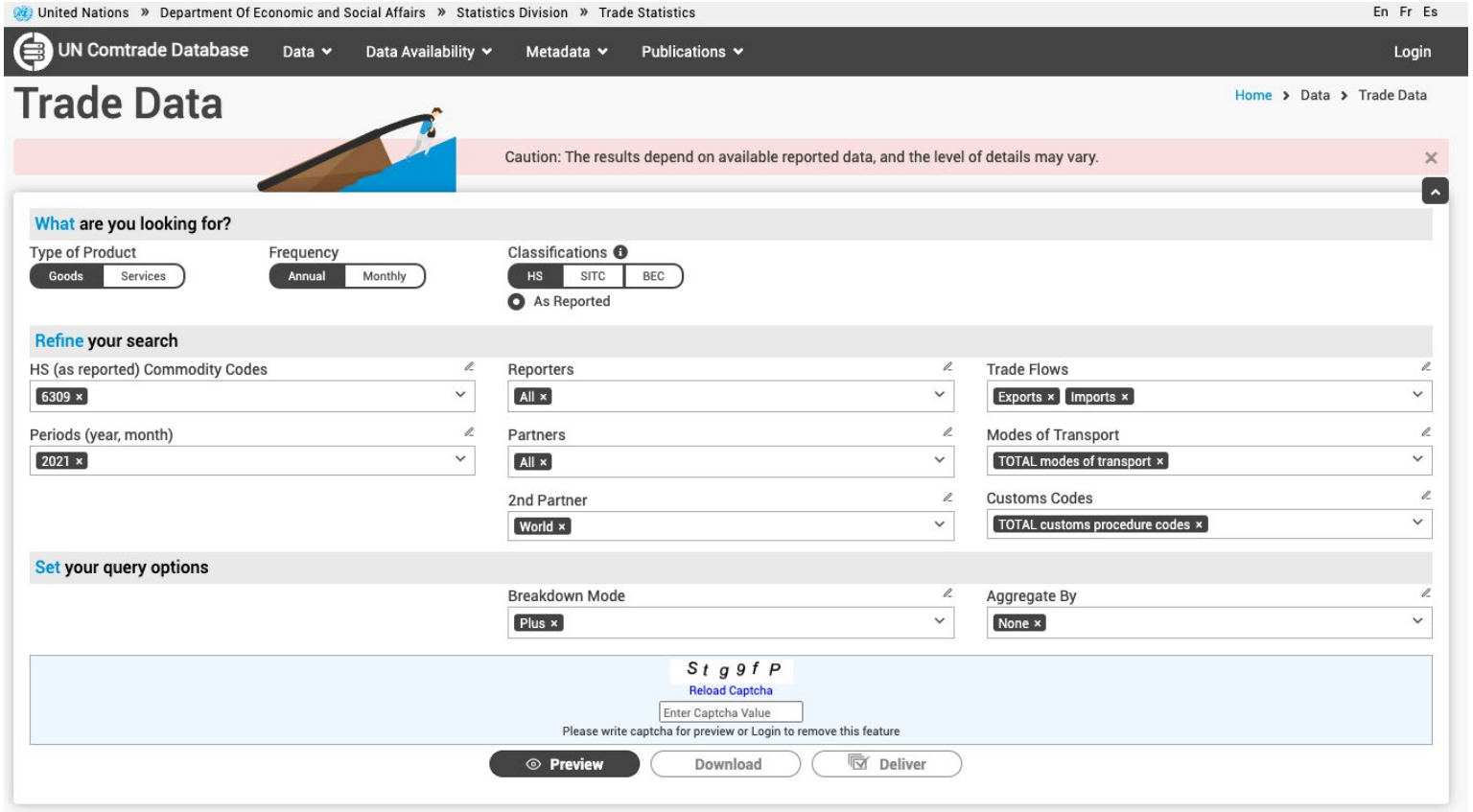
Data in pink was calculated by the Ellen MacArthur Foundation based on the source cited

Analysis of the UN Comtrade data using commodity code HS-6309

Scope

Where the data comes from:
Data on the international trade of items under commodity code HS-6309 was downloaded from the UN Comtrade.

What textiles have been included:
Commodity code HS-6309 covers textiles that, after sorting, are considered suitable for reuse and can be sold to international reuse markets, labelling them as "Textiles; worn clothing, and other worn articles". However, unlike other HS commodity codes, code HS-6309 does not have further sub-sections. As a consequence, there is no distinction between textiles that are suitable for reuse and resale and those that need repairing or remaking. In fact, some batches of textiles classed as HS-6309 may even contain rags and scraps,[92] which should normally be classified under code HS-6310 (labelled as "Rags; used or new, scrap twine, cordage, rope, and cables and worn out articles of twine, cordage, rope, or cables of textile materials").



What data was used:
The parameters selected for the data are shown in the screenshot below. All calculations have been made using the "Qty" data column from the downloaded CSV file from the UN Comtrade. Where there was no reported data in "Qty", this has been supplemented with comparable data (i.e. reported in kg) from the "AltQty" and/or "NetWgt" columns where data was available.

Assumptions

Reference year:
Data used in this analysis were downloaded from the UN Comtrade's website on 10th May 2024 for the years 1988–2021. We excluded data from 2022 onwards due to variations in reporting frequencies, as indicated in the UN Comtrade's methodology documents, which resulted in incomplete data from several countries for these years.

Calculating the global sum of imports and exports:
When computing the total volume of imports and exports for each country, we compared two different methods of extrapolating this information from the UN Comtrade database: (i) Using "World" in the Partner field; and (ii) Using the sum of all other countries (excluding "World") in the Partner field. Where the two values were not matching, we used data obtained with method (ii).

Calculating the historical overview of the global used textiles trade:
The import data from Mozambique was assumed to have been entered incorrectly into the UN Comtrade for the years 2016, 2018, and 2019 due to the fact that the quantity of used textiles imported by the country exceeded the next largest importing country by more than 60 times, for which no valid explanation could be found via desk research and stakeholder consultations. Import data from Mozambique was therefore excluded for those years when generating the figure for global imports.

Limitations

Data availability:
The UN Comtrade cautions that "the results depend on available reported data, and the level of details may vary". Data is continuously updated to Comtrade by the official national agencies mandated to disseminate trade statistics.

Data granularity:
The insights from this data does not include information on the effective physical quality of the textiles being traded. Further, trade data on imports and exports available from the UN Comtrade does not take into account that one item of used clothing may be traded through more than two countries (for example, for multiple stages of sorting). For this reason, imports from country A to country B do not equal exports to country B from country A.

Appendix E

A note on data points in the Technical Appendix:

Data in blue was taken directly from the original source cited

Data in pink was calculated by the Ellen MacArthur Foundation based on the source cited

Calculations behind Figure 3: The business case for sorters in Europe, Kenya, and India

Scope

What we mean by "reusable textiles":
Textiles that, after sorting, are considered suitable for reuse and can be sold to reuse markets, either nationally or internationally.

What we mean by "non-reusable textiles":
Textiles that, after sorting, are considered unsuitable for reuse due to them being worn out, damaged, or stained, but can be sold as feedstock for downcycling into lower-value applications, such as insulation material, wiping cloths, or mattress stuffing. Feedstock for textile-to-textile recycling has not been included as this process is not yet available at scale and there is currently no cost and revenue data available for this fraction.

What we mean by "waste textiles":
Textiles that, after sorting, are considered unsuitable for reuse, recycling, and downcycling. These textiles are sent to disposal through landfill or incineration.

Assumptions

The business case for sorters in Europe:

- **Values for the reusable fraction** have been computed as the weighted average between textiles sold in both national and international reuse markets. Although textiles sold on international reuse markets are larger in quantity, they generally generate lower revenues per unit compared to local markets.[93]
- **The cost per unit** includes average purchase costs, sorting costs, transportation costs, and disposal costs (only for the waste fraction).

Variation of the average margin per kg sorted based on the composition of sorted textiles, in Europe:

- The 60% share of sorted textiles classed as reusable in Europe was computed based on results from McKinsey & Company's interviews with European sorters in 2020.[94]
- In this model, it is assumed that a fixed 15% of sorted textiles will go to landfill or incineration. Although today this figure is reported by European sorters to be about 8%, it is expected to increase as a result of higher collection rates in the future.

The business case for sorters in Kenya:

- **Values** have been converted from KES to EUR based on the May 2024 conversion rate of 1 EUR = 140 KES.
- **The cost per unit** includes average purchase costs, sorting costs, transportation costs, and disposal costs (only for the waste fraction).

The business case for sorters in India:

- **Values** have been converted from INR to EUR based on the May 2024 conversion rate of 1 EUR = 90 INR.
- **Revenue per unit for non-reusables** is based on manually sorted materials.
- **The cost per unit** includes labour costs, rent, electricity, raw materials, transportation, maintenance, facility overhead costs, and disposal costs (only for the waste fraction). Values are based on manual sorting operations.

Limitations

Data availability:
While this report aims to provide a globally-relevant overview of the business case for sorters, the quantitative data required to generate regional statistics does not currently exist. Therefore, we have collated available secondary data on sorters operating in Europe and India, and supplemented this with primary data obtained through interviews with sorters operating in Kenya.

The business case for sorters in Europe

European sorter	Reusable textiles	Non-reusable textiles	Waste textiles	Source
Revenue per unit (€/kg)	1.67	0.12	0	Ellen MacArthur Foundation analysis based on data from Fashion For Good and Circle Economy, Sorting for Circularity Europe (2022); McKinsey & Company, Scaling textile recycling in Europe–turning waste into value (2022); Eigendraads, Van woorden naar draden (2022)
Cost per unit (€/kg)	0.80	0.80	0.93	
Margin per unit (€/kg)	0.87	-0.68	-0.93	

Variation of the average margin per kg sorted based on different compositions of sorted textiles, in Europe.

Share of reusable textiles	Share of non-reusable textiles	Share of waste textiles	Margin per kg of sorted reusable textiles	Margin per kg of sorted non-reusable textiles	Cost per kg of sorted waste textiles	Average margin per kg sorted	Source
%	%	%	€/kg	€/kg	€/kg	€cents/kg	
60%	25%	15%	0.87	-0.68	0.93	21	Ellen MacArthur Foundation analysis based on data from Fashion For Good and Circle Economy, Sorting for Circularity Europe (2022); McKinsey & Company, Scaling textile recycling in Europe–turning waste into value (2022); Eigendraads, Van woorden naar draden (2022)
50%	35%	15%	0.87	-0.68	0.93	6	
45%	40%	15%	0.87	-0.68	0.93	-2	
40%	45%	15%	0.87	-0.68	0.93	-10	
30%	55%	15%	0.87	-0.68	0.93	-25	
20%	65%	15%	0.87	-0.68	0.93	-41	

The business case for sorters in Kenya

Kenyan sorter	Reusable textiles	Non-reusable textiles	Waste textiles	Source
Revenue per unit (€/kg)	0.75	0.14	0	Ellen MacArthur Foundation analysis based on data from primary interviews with Kenyan sorters.
Cost per unit (€/kg)	0.47	0.47	0.63	
Margin per unit (€/kg)	0.28	-0.33	-0.63	

The business case for sorters in India

Indian sorter	Reusable textiles	Non-reusable textiles	Waste textiles	Source
Revenue per unit (€/kg)	0.60	0.14	0	Ellen MacArthur Foundation analysis based on data from Fashion For Good, Sattva Consulting and Circle Economy, Business Case Assessment: A report for Indian sorting hubs to gauge the implementation of sorting technologies (2023)
Cost per unit (€/kg)	0.32	0.32	0.40	
Margin per unit (€/kg)	0.28	-0.18	-0.40	

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About the Ellen MacArthur Foundation

The Ellen MacArthur Foundation is an international charity that develops and promotes the circular economy in order to tackle some of the biggest challenges of our time, such as climate change, biodiversity loss, waste, and pollution. We work with our network of private and public sector decision makers, as well as academia, to build capacity, explore collaborative opportunities, and design and develop circular economy initiatives and solutions. Increasingly based on renewable energy, a circular economy is driven by design to eliminate waste, circulate products and materials, and regenerate nature, to create resilience and prosperity for business, the environment, and society.

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Endnotes

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61 This is to ensure: (i) Value creation is retained in the country where EPR is implemented, thus providing additional incentives for producers to adopt reuse strategies as part of a circular business model; (ii) The externalities of managing textiles are not transferred to importing countries.

62 This is to ensure: (i) Decoupling of production from the extraction of new virgin resources; (ii) materials are circulated at their highest value.

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